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MONTESSORI AND HER INSPIRERS

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AND

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BY

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PREFACE

THE principal objects of this little work are to trace the history of the "Montessori Method"; to discover and explore the main sources from which its author received her inspiration and guidance; to show that her work is definitely concatenated with that of Pereira, Itard, and Séguin; to attract attention to the value and importance of the thought and achievements of these three very remarkable pioneers of modern education; to expound and examine from the point of view of the educational thought of to-day the principles and practice of the "Method."

The pages that follow contain many quotations from the works of Dr. Montessori and her inspirers. Several of these are introduced for the purposes of argument; others for exposition and illustration. It is the writer's hope that their use will enable the reader to appreciate more keenly than could any elaborate paraphrase or interpretation the finer qualities of the original writings. That hope has also induced him to refrain from translating from the French several of the shorter extracts contained in the text or given in the footnotes.

The writer wishes to acknowledge gratefully his indebtedness to Messrs. Heinemann for their permission, given with kindly courtesy and good will, to quote so freely from the works of Dr. Montessori which are published by them.

R. J. FYNNE.

Trinity College, Dublin,
July, 1924.

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INTRODUCTION

LIKE all other educational systems and methods, that of Dr. Montessori is not wholly original. Indeed, it may be said, and without derogating from the value and importance of her "Method," that what there is in it that is unquestionably original forms but a small part of the whole body of her doctrine and procedure. And this is all to the good. The fact that she is no mere innovator whose new ideas are unrelated to the thought and achievement of her predecessors must strengthen the claims of her work to the serious consideration of all who are interested in the progress of education. That progress, so intimately associated with human advancement in general, can only proceed along the course of development. All the great educational systems of the past embodied some unchanging truths, and therefore something from each of them must be found to-day in any system worthy of general adoption. Every principle underlying the Montessori Method was enunciated by previous educational thinkers or implied in their theories. The value of her work is largely due to

the fact that for each of these principles she has found a more definite interpretation and a more direct and enlightened application to school practice than we owe to any of her predecessors.

In the pages of John Locke who, like Dr. Montessori, was a physician and regarded many of the problems of education from the medical standpoint, we find three of her fundamental principles stated, while a fourth seems vaguely implied. The three may for brevity be referred to as the principle of *education through the senses,* the principle of *individuality,* and the principle of *freedom.* Locke held that all the materials of thinking must first come through the senses: from which it follows that all mental development, all education, must be dependent on sensation. In the *Essay Concerning Human Understanding* he writes: "Since there appear not to be any ideas in the mind before the senses have conveyed any in, I conceive that ideas in the understanding are cœval with sensation, which is such an impression or motion made in some part of the body as produces some perception in the understanding."[1] But although he clearly implies that the senses are of the first importance in education he nowhere suggests methods or means of sense training, whereas it is with such training that Dr. Montessori's practice is chiefly concerned. The principle of individuality is

[1] Book II., cap. i. 23.

prominent in Locke's thought, and it was chiefly because of the importance he attached to it that he held that boys should be taught by tutors—" the forming of their mind and manners requiring a constant attention and particular application to every single boy."[2] He would also allow the individual considerable freedom: " Children have as much a mind to show that they are free, that their own good actions come from themselves, that they are absolute and independent, as any of the proudest of you grown men, think of them as you please."[3] And his next sentence suggests to one's mind the Montessori principle of spontaneity: "As a consequence of this, they should seldom be put about doing even those things you have got an inclination in them to, but when they have a mind and disposition to it." Locke also insisted upon the necessity for closely observing the child and wisely advises that this is best done when the latter is free, as in play. But this observation is very different from the thorough scientific study of the individual pupil which is, according to its advocates, such an important feature of the Montessori system.

Rousseau enunciates as a great principle that education must be based on a study of the child, and in no way have his writings more profoundly

[2] *Thoughts concerning Education,* section 70.
[3] *Ibid,* section 73.

influenced educational theory and practice than by giving its first impulse to Child-study. . For him education must be in accordance with the nature of the pupil, who must be closely observed. "I wish," he says, " that some judicious person would give us a treatise on the art of observing children." And for him, as for Dr. Montessori, child life is not an abstraction, but the life of individual children. For him, as for her, education must ever be directly concerned with individuality, with the peculiar nature and needs of each pupil. Few thinkers have given such prominence to the principle of freedom. " The first of all goods," he writes, " is not authority but liberty. The man truly free wills only what he is able to do and does what pleases him. That is my fundamental maxim. It only needs to apply it to childhood and all the rules of education follow."[4] And, although he does not perceive its deep biological significance, he also believes in self-education. Émile is obliged to " learn of himself," and in this way does not advance out of proportion to his strength. When a child learns of himself he learns according to his nature, his individuality is active, and his freedom is preserved. The dependence of intellectual development upon the training of the senses and the consequent need for this training are among

[4] Quoted by Professor J. W. Adamson: *A Short History of Education*, p. 210.

his fundamental conceptions. In order that the child may learn to think he must exercise his members, his organs, his senses, for these are "the implements of our intelligence." The training of the senses involves much more than simple making use of them: the child must learn to *judge* by them: he must get all he can out of each of them. He must measure, reckon, weigh, but he must also *compare*. His spontaneity must have play, too. He wants to touch and handle everything in his early years; and his restlessness and curiosity must not be checked. Rousseau has, too, some conception of that "prepared environment" which, as we shall see, is one of Dr. Montessori's chief ideas: "As soon as a child begins to distinguish objects, a proper choice should be made in those which are presented to him."[5] In all this we see how closely the thought of Dr. Montessori is related to that of Rousseau. But the latter was not a practical educator. He failed to demonstrate the applicability of his principles to the actual education of the children of the people, evaded all the difficulties of teaching technique by imagining a pupil living and learning under altogether exceptional circumstances. If Dr. Montessori had devoted years of study to the works of Rousseau, as we shall find she did to those of other pioneers,

[5] Mr. Quick. Quoted in *Essays on Educational Reformers*, p. 260.

it is scarcely possible that she could by the guidance they gave her have evolved her scientifically conceived system of education.

Locke wrote the first educational work that deals primarily with the child. Rousseau, who was influenced by the philosophy and to some extent by the sensationalist psychology of Locke, wrote the first books that point out the direct dependence of educational theory and practice upon the nature of the child. But neither had any real knowledge —above all, any knowledge based upon direct observation and experiment—of children, of child life and its needs. Neither in the writings of these two great pioneers nor in the thought and work of their many followers could inspiration and guidance be derived by one who is, like Dr. Montessori, a trained scientific investigator whom nothing less will satisfy than the founding of educational theory and technique directly upon the laws and facts of child life as revealed by exact science. The greatest educational reformers of the nineteenth century—Pestalozzi, Herbart, and Froebel—who were followers of Rousseau, did not apply to the study of the individual pupil the methods of science. Nor did they directly found educational systems upon its teachings. Froebel, it is true, did formulate a system, and one whose principles and methods have still considerable influence upon the work of our infant schools. But the Kindergarten

is not based on facts of child life ascertained by direct observation and experiment. The suitability of its " gifts" and " occupations" to the needs of the child developing through self-activity was not determined by exact scientific methods. Explicit or implicit in the work of these three reformers may be found every great principle underlying the system of Dr. Montessori, while included in her elaborate didactic material are portions of Froebel's " gifts." But she has interpreted these principles in the light of science, and has applied them to the practical education of individual pupils in strictest possible accordance with the *observed* facts of the nature and needs of childhood. And such interpretation and application are not to be found in the work of any of the great reformers who deservedly occupy the most prominent places in the history of education. To them, indeed, she is little, if at all, indebted for inspiration or enlightenment.

And yet the system which bears her name is not the product of Dr. Montessori's unaided genius. It has a history which, though short, possesses real value and interest for students of education. Apart from her own work, that history is mainly concerned with the thought and practical achievement of but three of her predecessors. She herself, indeed, seems unaware of the very important pioneer work of one of these forerunners. Again and again through her writings, as we shall find in a later

chapter, she generously acknowledges her indebtedness to two distinguished doctors—Itard and Séguin. Itard (1775—1838) was for many years physician to the National Institution for the Deaf and Dumb in Paris, and through his experimental and educative work in that famous school he made valuable contributions to the science and art of deaf-mute education. To education in general, however, he made a more vitally important contribution through his wonderful observational and experimental treatment of the so-called Savage of Aveyron, an unfortunate boy of eleven found living what appeared to be a purely animal existence in the woods near Aveyron. Believing that civilised man was the joint product of nature and education and that without the latter he could never have become possessed of distinctively human characteristics, Itard saw in this wild boy the natural or savage being. This creature, he was convinced, was potentially a man and only required development by educative means. It was only necessary to draw forth and develop the child's latent powers; to add to nature the other essential factor which had necessarily been inoperative during a savage existence. So he began to teach the boy, and although it transpired in the sequel that his original diagnosis was wrong and that, as we shall see, the poor child was really an idiot, the value and significance of the experiments and observations he made

can scarcely be exaggerated. The work continued for four years, and was described in most minute detail in two pamphlets which are human documents of absorbing interest.

Dr. Séguin (1812—1880) devoted his life and great talents to the education of idiots, beginning his work in France and continuing it in the United States. He studied medicine under Itard for a time and became greatly interested in the latter's two pamphlets referred to above. Inspired by his great teacher, he began to specialise in the study of the causes and cure of idiocy and soon came to the conclusion that education afforded the best means for the amelioration of the lot of its unfortunate child victims. The result of long study, scientific observation, and ingenious experiments was the formulation of his great system of physiological education. Though this system was based upon the results of his investigations into the causes and relief of idiocy, he always insisted that it embodied the true principles and the best methods of normal education. Like Itard, he has left complete accounts of his work which are rich in the minutest details of procedure.

In the course of his enquiry into the physiological principles underlying education, Séguin became acquainted with the work of Jacob Rodriguez Pereira (1715—1780) who had devoted many years to the study and education of congenital deaf-

mutes. Unlike Itard and Séguin, Pereira was not a physician ; but he spent several years in acquiring a wide knowledge of the physiology of his time, and, as we shall see later, made a physiological discovery of the first importance. His work and its amazing practical results made a profound impression on the scientific mind of Séguin and inspired and informed his subsequent educational efforts. From Pereira's investigations he received valuable suggestions and actual knowledge concerning the importance of the senses in mental education, and indeed in general organic development. Pereira discovered the fundamentality of the sense of touch, and this biological truth enlightened Séguin's study and determined many of his methods. Unfortunately, Itard knew very little about Pereira's work which was in many important respects very much in advance of his own. Had he possessed full knowledge of this predecessor's wonderful experiments and expedients his own might well have accomplished still greater things. Dr. Montessori too appears to know very little about Pereira and nothing about his very remarkable achievements. Considering her long and intensive study of Séguin's writings, it is strange that she has failed to realise the inspiration and knowledge he derived from his predecessor.

Nevertheless, the history of the Montessori system must take full cognisance of the great work

of the first really scientific teacher of congenital deaf-mutes, who was the true originator of the Physiological Method from which that system has developed. In the following pages the direct indebtedness of Dr. Montessori to the system of Séguin will become evident. But it must be made clear at the outset that the work of the latter incorporated all the essentials of that of Pereira in regard alike to its spirit, its principles, and its practice. Séguin made a thorough examination of his predecessor's method and embodied the results of that examination in a valuable work[6] which he wrote in 1847.

The work of Pereira, Itard, and Séguin was concerned solely with the education of abnormal children, whom they examined and observed individually in the light of the best scientific knowledge of their respective periods. They sought for fundamental principles, performed numerous experiments, conceived expedients, and were, above all, practical teachers who bravely faced and solved numerous problems of practice that presented the gravest difficulties. As is now well known, Dr. Montessori too began her distinguished career as an educator of abnormal children. At the outset of her work among these children she went to the illuminating pages of Itard

[6] *J. R. Pereire*, etc.: *Analyse Raisonnée de sa Méthode*. As to spelling of Pereira's name see footnote to p. 28.

and Séguin and found therein inspiring thoughts and a wealth of knowledge. And when later she turned her attention to normal children she found that the principles which determined the wonderful methods of these men were applicable, as they themselves believed, to universal education.

Thus it was through the scientific study and education of idiots and other defective children that the principles of the Montessori Method were originally realised and its practice suggested. And the history of the Method is in effect the history of the work of Pereira, Itard, Séguin and Montessori, who form a distinct group of educational pioneers. To outline that history and to reveal the sources of Dr. Montessori's inspiration are chief among the modest objects of this little work.

MONTESSORI AND HER INSPIRERS

CHAPTER I

JACOB RODRIGUEZ PEREIRA (1715—1780) (*"Premier Instituteur des Surds-Muets en France"*)

JACOB RODRIGUEZ PEREIRA, the first teacher of deaf-mutes in France, was not a native of that country. He was born on April 11th, 1715, at Berlanga in the thinly-peopled Spanish province of Estremadura, which is to be distinguished from the large Portuguese district of the same name. He has been described as a Spanish Jew of Portuguese origin. The researches of M. Ernest La Rochelle[1] have shown, however, that although the Pereira family lived for several generations in the Province of Tras-Os-Montes in Portugal, its original

[1] *Jacob Rodrigues Pereire,* etc. *Sa vie et ses travaux.* Paris 1882, pp. 3 and 4.

European home was in Spain. To escape from the horrors of the fanatical anti-Jewish activities of the Spanish Inquisition the ancestors of Pereira migrated to Portugal at a date which has not been determined. It would seem that in the latter country the activities of the Inquisition, which was not established there till 1557, were more localised and less efficiently organised than in Spain. Towards the end of the seventeenth century, however, the campaign of persecution against the Jews was being vigorously prosecuted in Tras-Os-Montes, and so in 1698 Abraham Rodriguez Pereira, a trader and manufacturer of silk and velvet, father of Jacob Rodriguez, determined to emigrate with his wife and children to the sparsely-populated and comparatively remote province of Estremadura in Spain. Realizing now that no professing Jew in either country could possibly escape for long the agents of the Inquisition, Abraham Rodriguez and his wife, Abigail Ribca, decided upon the public adoption of and outward conformity to the Roman Catholic faith. Accordingly he assumed the Christian name of Juan while she took that of Leonor, and they had their children baptised. Jacob Rodriguez received the baptismal names of Francisco Antonio which he sometimes used in later life.[2] How long the family remained

[2] *E.g.*, verses written by him in 1734 were signed "Francisco Antonio Rodriguez."

in Estremadura is not known. We learn, however, that about 1740 the mother, who had been a widow since 1735, had returned with her numerous children to Braganza in Tras-Os-Montes where many of her own and her husband's relatives resided. There is a family tradition that she was condemned as a relapsed heretic by the Holy Office of Braganza and ordered to do penance publicly at the gate of the cathedral every day for a year. To escape this harsh and humiliating punishment she fled with her family to Bordeaux where she seems to have finally settled with relatives in 1741.

Very little is known concerning the early life of Jacob Rodriguez Pereira. Whether living in Spain or in Portugal the family did not dwell for long in any particular locality. Its members, like many other Israelitish families of the Peninsula, seem to have retained their nomadic habits, in which they were no doubt confirmed by the exigencies of commerce and the persecuting zeal of the agents of the Holy Office. Thus we do not know how or where Jacob Rodriguez received what would appear to be a good education in the Classics, Hebrew, Portuguese, Spanish, French, and the mathematical sciences, for which last he early manifested enthusiasm and remarkable aptitude. It is very probable that he did not fully share the unsettled life of his family. In 1734, at the age of 19, we find him in Paris where apparently he

had lived for a considerable period. We know, too, that before this he had lived in Bordeaux where several of his relatives had settled. Most probably, then, he received much of his education in these two French cities.

The earliest document found among Pereira's papers by M. La Rochelle[3] was a letter addressed to him in Paris from Bordeaux in 1734 by M. Barbot, a distinguished litterateur and savant who was a friend of Montesquieu. Pereira had written to M. Barbot, who was President of the Cour des Aides and Director of the Academy of Bordeaux, requesting information concerning the education of congenital deaf-mutes. This letter[4] which supplies the titles of several works on the subject, contains clear evidence that the older scholar was much impressed by the enthusiasm, ability and knowledge of his young correspondent, whom he had known in Paris.

It is of interest to consider what it was that impelled so young a man to resolve upon the dedication of his life to the education of deaf-mutes. Dr. William Boyd, basing his statement,

[3] *Op. cit.*, p. 5.

[4] Extract from M. Barbot's letter: "Voilà, Monsieur, les matériaux grossiers que j'ai trouvés dans mes recueils. Ce n'est qu'une table, mais à un entendeur comme vous il ne faut qu'un demi-mot, et vous surpasserez aisément ceux qui vous ont précédé. Permettez-moi de vous demander toujours la continuation des bontés dont vous m'avez honoré pendant mon séjour à Paris." La Rochelle, *op. cit.* pp. 5 and 6.

JACOB RODRIGUEZ PEREIRA.

apparently, on the articles on Pereira in Larousse's *Dictionnaire du 19e Siècle* and *La Grande Encyclopédie,* says: "Coming to Bordeaux at the age of 18 in pursuance of his business, he became acquainted with a young woman who had been dumb from birth. His affection for her led him to devote himself from that time to the discovery of means for making deaf-mutes speak."[5] The writers of the articles referred to would seem in their turn to have based their statements on conjecture and on a phrase which occurred in an address delivered by Pereira before the Royal Academy of Belles-Lettres at Caen in 1746—"Heureusement pour moi, Messieurs, l'amitié et la communication d'une personne muette m'ayant suscité cette idée." Two facts of great interest in this connexion have, however, been revealed by the researches of MM. La Rochelle[6] and Theophile Malvezin.[7] The first is that the estate of Berlanga upon which Pereira was born and spent some years of his life, was owned by a Spanish nobleman in whose family deaf-mutism was hereditary. One can easily imagine many circumstances arising from this fact which might serve to help the direction of the thoughtful mind of young Pereira to the consideration of the problem of overcoming the

[5] *From Locke to Montessori,* pp. 36 and 37.
[6] *Op. cit., p.* 6.
[7] Manuscript in the Bordeaux Library. Quoted by La Rochelle, *op. cit.,* p. 6.

greater drawbacks of this terrible affliction. But the second fact is of much greater significance. M. Malvezin ascertained that one of Pereira's own sisters was a congenital deaf-mute. Thus the future great teacher of such unfortunate children had daily presented to him during the most impressionable years of his life the problem of communicating with and helping one to whom he was no doubt devotedly attached.

As in the case of the first two decades of Pereira's life, very little light has been shed on the third from 1735 to 1744. It is known that during that period he travelled a good deal in the Peninsula and in France. We also know, though we have no particulars as to dates, that during this period, probably about 1740, he established in the house where he lived in the Rue des Augustins in Bordeaux the first school in France that was wholly devoted to the education of deaf-mutes. He charged no fees: for apart from the satisfaction to be derived by his charitable and humanitarian mind from the doing of such gratuitous work, he doubtless felt that the experience gained in this school and the opportunities it afforded him for observation and experiment were ample reward for his labours. Unfortunately no facts have come down to us regarding the duration of these labours, the number and ages of his pupils, or the nature of his experiments and methods of teaching. The decade we

are now considering was mainly devoted by Pereira to the intensive theoretical and practical study of his subject, and as in all probability the work of his Bordeaux school was intended by him as part of that study he would naturally refrain from making public the nature and results of his efforts. During these ten years which followed the receipt of the letter from M. Barbot referred to above he closely studied the works recommended in that communication and such others on the subject as became accessible to him, and in this way acquired a knowledge of the efforts of his predecessors in this educational field. And here it may not be without interest and profit to consider what had been done by some of those who had previously endeavoured by educational means to alleviate the lot of congenital deaf-mutes.

Among the Ancients the case of the deaf and dumb was apparently regarded as hopeless. Aristotle denied that they possessed intelligence. The Roman Law denied them many of the essential rights of citizenship. As to the possibility of educating them, the general opinion of the Ancient World is no doubt expressed in the couplet of Lucretius :

> *To instruct the deaf no art could ever reach,*
> *No care improve them, and no wisdom teach.*

St. Augustine asserted that they could acquire no

knowledge of the Faith.[8] The Venerable Bede, indeed, relates that St. John of Beverley taught a deaf young man to read the lips and to speak; but he regarded it rather as a miracle than as an educational achievement.[9]

Several other cases are mentioned by later mediæval writers, who are generally sceptical because of the seeming impossibility of such feats. It was not until the sixteenth century that the education of the deaf and dumb came to be regarded as practicable. Jerome Cardan (1501—76) of Pavia, an eccentric genius and speculative philosopher, who may have had no definite knowledge of the deaf, wrote: "Writing is associated with speech, and speech with thought, but written characters and ideas may be connected without the intervention of sounds": and argued from this that "the instruction of the deaf is difficult, but it is possible." He asserted the possibility of teaching them to read and to communicate in writing, and declared them capable of knowing and honouring God."[10] Pedro Ponce de Leon (1520—84), a Spanish monk of the Benedictine monastery of San Salvador of Oña, wrote in 1578: "I have had for my pupils, who were deaf and dumb from birth, sons of great lords and

8 *Contra Julianum Pelagianum.* Book III., 10.
9 Kerr Love and Addison, *Deaf Mutism,* 1896; p. 228.
10 La Rochelle, *op. cit.,* p. 8. Kerr Love and Addison, *op. cit.,* p. 231.

notable people, whom I have taught to speak, read, write and reckon." One of these people, he says, " was ordained and held office and emolument in the Church, and performed the service of the Canonic Hours."[11] Among the archives of his monastery is a document in which he states that his deaf-mute pupils "spoke, calculated, prayed aloud, served Mass, confessed, knew Greek, Latin, Italian, and understood natural philosophy and astrology."[12]

Unfortunately he left no account of the methods by which he obtained such remarkable results. In 1620 another Spaniard, Juan Pablo Bonet (d. 1629?), wrote a book[13] on the teaching of deaf-mutes. He began by teaching them to write the letters of the alphabet and then taught the phonetic value of each letter. " The scholar," he wrote, " is dumb because he is deaf, and cannot by any means have his hearing restored. But by sight he can acquire the knowledge lost by deafness."[14] In teaching speech he " exercised the scholar in placing his tongue, teeth and lips in the positions suitable to the articulation of each letter; then made him exhale the air necessary for the

[11] *Vide* H. N. Dixon's English translation of Bonet's book mentioned below. Historical Introduction by A. Farrar, pp. 28 and 29. Pub. 1890.

[12] La Rochelle, *op. cit.* p. 8.

[13] *Reduccion de las letras y arte para enseñar a hablar los mudos.* Madrid, 1620.

[14] Dixon's translation, pp. 151 and 152.

production of voice." He gives rules for the production of this "artificial articulation." Bonet also made use of gesture and of a manual alphabet. In his book he outlined, according to M. Gerando,[15] an inductive method of grammatical instruction and a philosophic scheme of education which led from intelligence to language. During the seventeenth century there were five British teachers of the deaf and dumb, and they all left records and descriptions of their work. They were John Bulwer (fl. 1654), Rev. William Holder, D.D. (1616—98), George Dalgarno (1626?—87), George Sibscota (fl. 1670), and Rev. John Wallis, D.D. (1616—1703). Of these the most important was Dr. Wallis, the famous mathematician and Savilian Professor of Geometry at Oxford. He was the author of numerous mathematical and theological works, and also of an English Grammar, written in Latin in order that it might be of use to foreign students. Appended to this Grammar, which was published at Oxford in 1653, was a treatise or essay on words, or the formation of sounds, entitled *De Loquela*. In this treatise he outlines his methods of teaching the deaf and dumb. He made use of writing, reading, a manual alphabet and "logical induction," as well as of such gestures only as were borrowed from the pupils themselves. Later, in

[15] *De l'education des sourds-muets de naissance*. Paris, 1827. Quoted by La Rochelle, *op. cit.* pp. 9 and 10.

1660 and 1661, he taught two deaf-mutes by a process of " artificial articulation" not unlike that used by Bonet. He claimed to have taught his pupils not only to pronounce words distinctly, but to express their own thoughts either orally or in writing and to read and understand what was written for them by others. He made no use of lip-reading and did not claim that his pupils understood spoken language. The Spanish Netherlands produced another seventeenth century teacher of congenital deaf-mutes in François Mercure van Helmont (1618—93), a son of Jean Baptiste. In his book, *Alphabeti Vere Naturalis Hebraici Brevissima Delineatio, etc.* published in 1667, he makes somewhat extravagant claims in regard to the rapidity with which he achieved success by means of lip-reading and " artificial articulation." Another teacher who most successfully made use of these two methods was Jean Conrad Amman (1669—1724), a Swiss physician resident at Haarlem. His book, in which he describes his work and its results, and which had a great influence, especially in Germany, on the later teaching of deaf-mutes, was first published in 1692 under the title of *Surdus loquens,* and again in 1700 under that of *Dissertatio de loquela.*

Such was the work of the most important of Pereira's predecessors. But it cannot be said with certainty that he knew all the records and descrip-

tions referred to in the foregoing brief review. Several of the books mentioned above were noted in the list supplied him in 1734 by M. Barbot, who especially recommended that of Amman and pointed out that it contained references to the work of van Helmont and Wallis. He apparently continued to study and use this book for many years, for as late as 1762 he wrote an analysis of it in French, which he dated, and which was found among his papers by M. La Rochelle. His interest in this work is very significant and is easily explained. While not under-estimating the value to teachers of the deaf and dumb of those methods which involved reading and writing, "logical induction," lip-reading, manual signs for letters and syllables, and gestures, he was far from being satisfied with them. For years he sought to discover a scientific method—one that should be based directly upon the sciences which treated of the potentialities and adaptabilities of the human organism. In his study along these lines he found Amman's book of great assistance. Its author was, as we have noted, a physician, and his method of artificial articulation was founded upon his knowledge of the anatomy of the vocal organs. These organs of the deaf and dumb child could be placed in the position proper for the production of any given sound, and then by example and gesture the teacher could indicate to him how to breathe

so as to produce that sound. Further, by grasping the teacher's throat during the process of articulation Amman's pupils were enabled to learn through their sense of touch the vibrations associated with different sounds. When by practice they became proficient in the production of sounds these were associated with their written characters, and in this way, and by the help of lip-reading, they were gradually enabled to read and write and speak.

But even this did not satisfy Pereira. He believed that by a profound study of physiology and anatomy he could discover principles and facts upon which to found a new theory and practice of deaf-mute education. Accordingly, it was to this study that he mainly devoted the third decade of his career. We have, unfortunately, no information as to how or where he pursued his studies apart from our slight knowledge of his practical experimental work in his Bordeaux school. We do not know, for example, whether he worked under competent teachers or relied chiefly upon private study. The special works written on Pereira by Séguin in 1847, by Hément in 1875, and by La Rochelle in 1882 show that he made himself thoroughly acquainted with the anatomy and physiology of his day. And it must be remembered that these two allied sciences had made great progress by 1740. As early as 1543 the brilliant young Belgian anatomist, Vesalius, had published his *Fabrica*

Humani Corporis, a remarkable book abounding in facts ascertained by dissection. In 1628 William Harvey had given to the learned world his epoch-making work, *Exercitatio Anatomica de Motu Cardis et Sanguinis*. The researches of Pequet led in 1650 to the discovery of the thoracic duct, while in 1653 Rudbeck discovered the lymphatic vessels. In 1661 Malpighi of Bologna, who had previously demonstrated the existence of the capillary system, observed by the aid of his microscope the actual passage of the blood through the capillaries. Malpighi also investigated minutely the glands of the human body and the sensory papillæ of the skin. In 1677 Hamm, a young Dutch physician, discovered spermatozoa. These he brought under the notice of Leeuwenhoek, who had previously made minute microscopical examinations of the blood corpuscles and had discovered bacteria. Leeuwenhoek soon perceived and announced the physiological rôle of spermatozoa. The period 1661—1740 has been selected by Professor Miall[16] for special discussion. It was an age of great scientific activity and fertility in which were established new scientific societies—the Royal Society, the Academy of Sciences of Paris, Academia Naturæ Curiosorum, and others. During this period, when the efficiency of the microscope was gradually improved, the Minute

16 *History of Biology*, 1911; pp. 28 *et seq.*

Anatomists, the Comparative Anatomists, the Biologists and the Physiologists made numerous important discoveries. The two most famous works of Hermann Boerhaave (1668—1738)—*Institutiones Medicæ, etc.* and *Aphorismi de Cognoscendis et Curandis Morbis, etc.*—which contained practically all the physiological and anatomical knowledge of the time, were published in 1708 and 1709. From 1706 to 1719 Morgagni (1682—1771) published his six series of great works under the title of *Adversaria Anatomica,* in which he popularised among medical men the practice of exact scientific observation and examination. These works systematised and extended the physiology and anatomy of the period, especially the knowledge handed down by his own illustrious predecessors in the Chair of Anatomy at Padua, including Vesalius, Fallopius, Casserius and Spigelius. It is worthy of note that Morgagni dealt specially with the organs of speech. Several of the eighty-six medical works of Albrecht von Haller (1708—1777) also appeared before 1740. Practically all these works were easily accessible to Pereira either in French and Spanish translations or in their original languages; for we know that he was a very good linguist. Two specialist works of the period are also worthy of mention. In 1683 and again in 1716 Duvernoy of Tübingen, one of Haller's teachers, published his *Traité de L'Organe*

de L'Ouïe, a work which Pereira quoted during his controversy with Ernaud in 1762. And in 1704 appeared Valsalva's work on the *Anatomy and Diseases of the Ear.*

But even if Pereira's long study of his subject had included all the works referred to in the above summary they would not have revealed to him the secret he sought. They supplied him with fundamental principles and facts, but it was only by the exercise of original thought, by making, indeed, a physiological discovery on his own account, that he was enabled to find a definite scientific basis for his method. We cannot do better than here quote *in extenso* Séguin's remarkable paragraphs[17] dealing with this discovery and some of its results :

" Since Morgagni, Boerhaave, Haller, had brought physiology to its true place, that is to say, ahead of all other medical sciences, it had been considered and used as a reliable element of progress in various branches of anthropology. Among the special labours founded upon its recent discoveries, none had been more conspicuous than those of Jacob Rodriguez Pereire,[18] who taught congenital deaf-mutes to speak ; communicating

17 *Idiocy: and its Treatment by the Physiological Method.* Columbia University Reprint; New York, 1907; pp. 18—20. See footnote, p. 148.

18 The spelling adopted by practically all the Continental writers on Pereira. " C'est lui-même qui paraît avoir, de

to them, not only a natural voice and a correct pronunciation, but even his *accent gascon,* or peculiar southern emphasis. So said every one who followed his admirable teachings, Buffon, Lecat, Bezout, Diderot, etc. So can we say ourselves, with many living witnesses, Charton, Carnot, Leroux, etc., who have seen and heard in 1831, in the salons of the Rue Monsigny, Mlle. Marois the last surviving pupil of Pereire, when she came from Orleans to visit the then unknown grandsons of her beloved teacher. Yes, we heard, decrepit, that voice which Buffon heard in its silvery tones of youth. Unfortunately we were too young and ignorant to pay due attention to this wonder; and our reminiscences of it are bare of the particulars which could make them valuable.

In this teaching, Pereire entered into communication with his pupils, by the use of, first, the manual alphabet engraved in the curious Spanish book of Juan Pablo Bonnet, 'Reduccion de las Letras y arte para enseñar a hablar los mudos. Madrid: 1620.' Second, of another syllabic manual of forty-odd signs of his own invention. Third, the natural resources of expression offered by pantomime. As soon as Pereire was understood

bonne heure, francisé son nom, ainsi qu'on peut l'inférer de l'orthographe adoptée dans les premières mentions faites de lui, et vraisemblablement sous ses yeux, par le *Mercure de France,* en août 1747 et dans les jugements portés sur sa méthode par l' Académie des sciences, de 1749 à 1763." La Rochelle, *op. cit.* p. 3.

by his pupils with the help of these temporary means of communication, he commenced to teach them to speak the speech proper, derived from the consciousness of the reciprocal nature of language. This consciousness could only be given to the deaf by a physiological discovery. Pereire analysed the speech into two elements: the sound, and the vibration which produces it: the first which the ear alone can appreciate, the second that any flesh vibrating itself may be taught to perceive. He conceived that ordinary men hear the sound, without, most of the time, noticing the vibrations; but that the deaf, who cannot hear the sound, may nevertheless be made the recipients of vibrations. Hence, a given vibration producing only a given sound, the deaf taught to perceive the vibration, could not imitate it without reproducing likewise the corresponding sound of language. It is thus that he practically made his pupils hear through the skin, and utter exactly what they so heard. By this discovery Pereire demonstrated to the physiologists of his day, that all senses are modifications of the tact, all touch of some sort.

Buffon, taken by surprise at the sight of the deaf-speaking pupils of Pereire, and though knowing only a part of their mode of education, confesses to the novelty of the discovery in these terms: 'Nothing could show more conclusively how much

the senses are alike at the bottom, and to what point they may supply one another.''—[*Natural History of Man,* 1st edition.]

This, then, was Pereira's great physiological discovery—the discovery of the fundamentality of the sense of touch, and of its wonderful educational or developmental potentialities, especially in regard to the perception, interpretation, and reproduction of vocal vibrations. And if we can fully appreciate the truth of this fundamentality and of the existence of such potentialities we shall not suspect Séguin and others of the exaggeration of enthusiasts even when they tell us that Pereira's deaf-mute pupils acquired his *accent gascon.* Indeed one of the charges brought against him by at least one of his opponents was that he communicated a foreign accent to his pupils.[19] In this connexion the following striking sentences of Miss Helen Keller's are valuable as evidence: '' By placing my hand on another's throat and cheek I enjoy the changes of the voice. I know when it is low or high, clear or muffled, sad or cheery. The thin, quavering sensation of an old voice differs in my touch from the sensation of a young voice. A southerner's drawl is quite unlike the Yankee twang. Sometimes the flow and ebb of a voice is so enchanting that my fingers quiver with exquisite pleasure, even

[19] By Ernaud. *Vide* La Rochelle, *op. cit.,* p. 224.

if I do not understand a word that is spoken."[20] And Miss Anna Sullivan, the teacher of Miss Keller, writes :

"Not enough emphasis has been put on the sense of touch, which is the great sense. The whole skin sees and listens, and not only the skin but the entire body, bones and muscles. Psychologically, and as a matter of biological history, hearing and sight are only specializations of the sense of touch, and, as the parent of these senses, it has many capacities which in normal people have been appropriated by the finer offspring : these capacities are still available in the redemption of the deaf-blind from idiocy. Through them by tactual experience of the outer world, combined with a language which is instinct with the wisdom of the race, the twice-buried mind can know the sun, the sea, and the stars."[21]

Even without special training the deaf-mute's sense of touch is peculiarly acute. With intelligent training its receptive and discriminative efficiency can be greatly increased. Thus, by the exercise of his great personal skill, patience and perseverance, and by prolonged practice, Pereira

[20] *The World I live in.* pp. 65 and 66. The reader will remember that these are the words of a blind deaf-mute.
[21] From her article on the Deaf-blind in *Monroe's Cyclopedia of Education.*

was able to teach his pupils to distinguish clearly various vocal vibrations that produce the different sounds of the French language. Each pupil was made to grasp in the most effective way the throat of the master while the latter produced a particular sound. Nor was this all. The teacher also made use of the pupil's sight. The deaf-mute's powers of ocular observation are also greater than those of normal persons, and Pereira made his pupils most closely observe the positions and movements of the throat, jaws, tongue, teeth and lips during the process of sound production. Each pupil was then taught to place his own vocal organs in the same position as that of the master's for any given sound, to make the same movements, and to set up the same vibrations, these last being perceived by his sensitive fingers. Joined to all this was careful training in correct breathing, the pupil here learning by sight and touch the proper positions and movements. Thus the pupil was enabled to produce sounds himself, and it was easy to indicate to him by gesture whether or not he enunciated correctly. When a sound was correctly produced its repetition was continued until all the processes involved became automatic.

But Pereira's principles and practice involved very much more than this brief outline suggests : and we must now proceed to consider his whole method in some detail. Every new pupil introduced to him

was at once subjected to a thorough examination which was always conducted, as he says in his *Observations*,[22] "avec une tres-grande exactitude." The first object of this examination was to determine beyond doubt whether deaf-mutism was the real and sole cause of the pupil's condition. Here he had to ascertain whether or not there were indications of idiocy or imbecility or of any other form or degree of mental deficiency. If there were any such indications he declined, as a specialist, to undertake the education of the child. His next care was to ascertain whether the physical causes of the pupil's deaf-mutism were such as could be removed or lessened by surgical or medical treatment. He searched minutely for any malformation or defect of the ear and vocal organs. When he was certain that the pupil was deaf, and was mute only because he was deaf, Pereira next proceeded to determine to what class and degree of deafness the particular case was to be assigned. His classification, while it might be regarded as crude by the aurist of to-day, was much in advance

[22] *Observations sur les Sourds et Muets, et sur quelques endroits du Mémoire de M. Ernaud.* Published in *Mémoires de Mathematique et de Physique, presentes à l'Academie Royale des Sciences, par divers Savans and lûs dans ses Assemblées* in 1778. In the same volume was published Ernaud's *Memoire sur les Sourds et Muets* in which he adversely criticised Pereira's method. The *Observations* is a short treatise of thirty pages containing twenty-eight numbered sections. Our references are to these sections.

of that in use among the physicians and surgeons of his own time. Séguin,[23] who was a distinguished physician, writing in 1847, pointed out that the classification of deafness generally adopted by the medical profession even at that date was inferior to Pereira's.

Deaf-mutes were arranged by Pereira in three classes. The first class contained all those who were absolutely incapable of hearing. This total deafness he ascribed to some irremovable obstruction or paralysis of the auditory nerve.[24] Cases of this kind are very uncommon, so much so that Ernaud refused to believe that any were known. Every alleged case that the latter observed gave some indications that certain noises could be heard. Pereira, however, maintains that such indications are deceptive. The subject does not *hear:* he but indicates that he *perceives in some way* the sounds under consideration. "There are," he writes, "a thousand occasions on which, without the help of sight, these deaf persons perceive, not only the discharge of a cannon, the passage of a carriage, the striking of a drum, but the closing of a door, the fall of a chair, the playing of a chord

[23] *Jacob Rodrigues Pereire,* etc., *Notice sur sa vie et ses travaux,* etc. Paris 1847. The account of Pereira's method given in the text is largely based on this work, the second part of which is entitled *Analyse Raisonnee de sa Methode de Pereire.*

[24] *Observations:* VII

on a loud instrument; even the voice of a person speaking in ordinary tones, if they touch the speaker or only the chair on which he is seated: and all this because these sounds produce in everything that touches us externally—perhaps even in the tendinous part of the diaphragm and in the air enclosed in all the cavities of the body—tremblings or shocks which are, we may say, for the deaf a kind of start or tremor much less powerful, but almost of the same kind, as that which we experience when a carriage passes rapidly under an archway near us."[25] He goes on to point out that congenital deaf-mutes, often at an early age, learn and use such words as *Papa* and *Mama,* but later forget or cease to employ them. His explanation of this phenomenon is most interesting and suggestive. It is that in early infancy the child is for long periods in close bodily contact with its mother and that naturally it watches her intently. Thus it learns by sight the positions and movements of the speech organs, and perceives through touch the vibrations that produce such frequently used words. Then later, when not so often or for so long nursed by the mother, and when its eyes are attracted by the sights of its widening world, the child forgets the words or how to produce them. He adds that it is probable that in this way normal children are also aided in their acquisition of speech

[25] *Observations,* IV.

by the senses of sight and touch, and that such acquisition would require a much longer period if they always learned by the ear alone.

Pereira's second class included " all those who, independently of the sensation of which I spoke (above), have the organ of hearing accessible to different kinds of noises, and are capable of knowing and comparing in certain cases the degree of force and some other qualities of these noises ; but cannot hear or understand the sound of the voice." The deafness in these cases he attributed to some impediment or clog or some kind of malformation of the innermost cavities of the ear—the vestibule, semi-circular canals, and the cochlea.

His third class comprised all those who not only can hear noises more or less loud, but can also distinguish some vowels and are able to appreciate the difference between them. This partial deafness he considered due to an accumulation of matter in the middle ear, to a relaxing of the tympanic membrane, or to some obstruction of the auditory canal. Many cases in this class could be cured or improved by medical or surgical means. In this class Pereira also recognised several degrees of deafness which for purposes of illustration he compared with the different powers of vision experienced by a normal person while looking through a varying number of layers of gauze. By careful experiment in his Bordeaux school and elsewhere

Pereira satisfied himself that pupils of almost all the degrees in this class could have their powers of hearing appreciably strengthened by careful training: and for this purpose he devised a number of exercises[26] in the course of which the pupils practised attending to and distinguishing sounds of many kinds (including those of the voice), of various degrees of loudness and pitch, and proceeding from different distances and directions.

Having examined the pupil with meticulous care from the standpoint of anatomy and physiology, Pereira in the next place made close inquiries from relatives or guardians concerning such mental and moral qualities as one so afflicted could be observed to possess, and as to the gestures and signs which he had already learned to use in communicating with those with whom he was associated. By means of these gestures and signs the master then entered into communication with the pupil, and thus added as much as possible to the knowledge already obtained by his inquiries. If he decided to undertake the education of the child he continued, for a short time only, the use of the latter's own gestures and signs in order that confidence, understanding and sympathy might be established between himself and his charge. Afterwards he gradually introduced and taught the signs devised

[26] *Des gymnastiques propres à développer l'audition chez les sujets qui perçoivent encore, avec les bruits, quelques sons de la voix humaine.* Séguin: *J. R. Pereire*, etc., p. 334.

by himself. Before proceeding to consider in detail Pereira's manual alphabet and sign system it should be mentioned that for many of the higher and finer processes of thought and " les affections de l'âme" he made free use of ordinary gesture—" la mimique générale."

His manual alphabet was, as we have learned above from Séguin, based on that of Bonet which, however, he had improved and very greatly extended. It was, indeed, much more than an *alphabet:* Séguin calls it " un syllabaire dactyllogique." The following description of it is translated from a letter[27] written by Saboureux de Fontenay, who was one of Pereira's pupils, and who invented for it the name " Dactyllologie" : " It is a kind of alphabet in the Spanish form, contained in the fingers of one hand ; it is composed of twenty-five signs for written letters, not including the two letters *K* and *W,* which are not used in the French language, and of signs which M. Pereira has invented with the single view of exactly conforming his manual alphabet to the laws of French pronunciation and orthography. Thus there are as many vocal sounds, which number thirty-three or thirty-four, and as many letter liaisons for ordinary writing, which amount to thirty-two or more (each liaison making one sound), as there are signs in the manual alphabet, which

[27] Quoted by La Rochelle, *op. cit.* pp. 97 and 98.

for that reason I call the Dactyllologie, a name adopted by M. Pereire. It is true there are letters and letter liaisons which change their sounds according to the words in which they are found: the Dactyllologie well expresses all these different sounds, whether of a single letter or of a liaison of letters: consequently it is seen to include in all more than eighty signs. In this Dactyllologie the hand is used like a pen to trace in the air punctuation marks and accents; to indicate capital and ordinary letters and the usual abbreviations; by the movements of the fingers are shown the long, medium, short, and very short pauses which are observed in pronunciation. The Dactyllologie also contains signs for noughts, units, tens and hundreds of a kind that easily and quickly express large numbers and the operations of arithmetic. Thus the Dactyllologie is as convenient, as prompt, as rapid as even pronunciation, and as expressive as good writing. Other signs may be added to the Dactyllologie to adapt it to the rules of prosody, of singing, of poetry, etc. One can if he wishes use a manual alphabet which contains only the signs for the vocal sounds and which is very convenient for those without learning."

The following extract from Pereira's own short account reveals to us his conception of the physiological and psychological principles underlying the theory and practice of the Dactyllologie: "My

manual alphabet, which I shall henceforth call my Dactyllologie, a name invented by M. de Fontenay, my old pupil, is free from these defects[28] and combines a number of advantages; it removes the difficulties of orthography, teaching it imperceptibly to the dumb, saves them the disagreeable task of studying it, as well as the forbidding labour of spelling the letters in order to learn to read; finally, it anticipates and prevents ambiguities in the pronunciation and in the writing of all sorts of words. The secret of all this principally consists in the fact that my Dactyllologie has not less in view the sounds of the language than the letters which are used to indicate them, and that consequently each particular position of the fingers denotes, at the same moment, firstly, the proper position and movements of the vocal organs for the production of a given sound, and secondly, the character or characters required by the usual spelling to represent that sound. Not only does my Dactyllologie give to my pupils facility in pronouncing all kinds of words without hesitation, and in writing them correctly (an advantage which articulation cannot provide for those who have the use of all their senses), but it also serves me singularly well in correcting their errors of articulation and in restoring immediately the organic move-

[28] The defects of the manual alphabet as enumerated by Ernaud in the *Mémoire* referred to in a previous footnote. Ernaud had no actual knowledge of Pereira's Dactyllologie.

ments necessary for proper pronunciation : and all this because by the habits they form each of my signs is immediately associated in the pupil's mind with a particular arrangement of the vocal organs always and constantly the same for the same sound."[29]

We have already seen[30] how Pereira taught his pupils to produce sounds—by the skilful use and development of their senses of sight and touch,[31] and of the powers of their nervous and muscular systems to imitate and, by practice, to reproduce at will any given positions and movements of the vocal and respiratory organs. We have now to see the connexion between this procedure and the use of the complex and ingenious system of manual signs described above. As soon as he had perfectly learned a sound the pupil was taught the ordinary written letter which represented it. When, after the necessary practice, the mental and physical associations between the letter and sound were firmly established the corresponding manual sign was taught. This sign, as Pereira points out, represented not only the letter and the sound, but

[29] *Observations:* XVIII.

[30] *Supra*, p. 33.

[31] In addition to the training of these two senses for the specific purpose of studying the position and movements of the vocal and respiratory organs, he also endeavoured to train them generally by carefully arranged exercises—" des gymnastiques spéciales de la vue et du tact derigées dans le but de faire perçevoir par ses deux sens tous les phénomènes physiques destinés à être perçus par l'ouie dans l'individu normal." Séguin, *op. cit.*, p. 334.

also the organic positions and movements necessary for the production of the latter. By continual practice these four elements—positions and movements, sound, letter, manual sign—were definitely associated into a permanent unity, into that which in the scientific language of to-day would be described as a group forming in the nervous system a " secondary disposition " or an " engram complex." In this way all the sounds, letters, letter groups and liaisons of the French language were gradually taught : and the account by Saboureux given above shows how every detail required in the reading and writing of that language was provided for in the Dactyllologie. The latter could also be used with ease for conversing in the dark, the various manual signs being determined by touch. Saboureux tells[32] of several conversations between Pereira and himself which were conducted in this way in the dark.

It will be clear from the foregoing account of his method that Pereira's work involved not only the specialized study of human physiology and anatomy, and some consideration of the psychological aspects of his theory and practice, but also a profound study of French phonetics. The significance of this study and its results was not appreciated by his rivals and opponents, the majority of whom were mere empiricists. Nor does

[32] In the letter quoted *supra*, p. 39.

it appear that it was appreciated by the many scientists who, after strict examination and tests, reported most favourably upon his method and its results. Séguin and La Rochelle, however, in their elaborate estimates of the scientific value of the work of *le célèbre mutismicien,* attach due importance to his " bonne théorie de l'articulation de la langue française." It must be added that his knowledge and use of phonetics were not limited to the practical requirements for the teaching of French to deaf and dumb pupils, but were based on a sound scientific study of the subject. We have already noted his study of the vocal and respiratory organs ; and to this he early added an investigation of the phonetic principles exemplified in the several languages with which he was well acquainted. His advanced knowledge of this subject is clearly shown in the excellent little treatise,[33] containing only seven small pages, which he wrote in 1772 for Bougainville, the famous traveller. The latter had submitted to Pereira for expert examination a vocabulary of the language of Tahiti which he had compiled, at the same time introducing to him a native of that island whom he had induced to accompany him to Paris. Pereira's scientific observations on this vocabulary

[33] *Observations sur l'articulation de l'Insulaire de la mer du Sud, que M. de Bougainville a amené de l'île Taiti & sur le Vocabulaire qu'il a fait du langage de cet île.* Appended to Bougainville's *Voyage autour du Monde,* 1772.

and on the articulation of the islander supply, as Dr. Boyd points out,[34] a refutation of the charge of empiricism which has been made against him.

We are now in a position to take a comprehensive view of Pereira's method as a unified whole. Fundamentally, his problem, though presenting many additional grave difficulties, was that which all educators have to endeavour to solve. Three great factors have always to be considered. Firstly, that " immature, undeveloped being," the educand, has to be studied. To-day we realise that we must acquire all possible knowledge concerning him—all that physiology, psychology, biology and other sciences have to teach us. Secondly, we have to decide upon what we desire him to know, to will, to feel, to be, and must examine that complex for fundamental laws and facts. And thirdly, we must give due attention to the educative process, to the interactions and relationships we wish to initiate or encourage between the first and second factors. It is not suggested that Pereira viewed his problem in this broad way. His view was necessarily narrowed by the peculiar difficulties and aims of his special task. But he did, as we have seen, most carefully study the educand, both from the point of view of general principles and from that of individual powers and needs. He sought the greatest attainable knowledge of the poten-

[34] *From Locke to Montessori*, p. 43.

tialities, tendencies, and adaptabilities of congenital deaf-mutes in general and of each of his own pupils in particular. As to the second factor, naturally for him the great desideratum was the pupil's acquisition of language, though he never lost sight of the ultimate end of his work as the intellectual, moral, social and æsthetic development of those whom he taught. We have seen how he sought for the fundamental laws and facts of language and based his teaching on the principles of phonetics. Finally, he devoted years to the study of special educative processes and their ways and means; and he devised expedients and formulated a procedure which enabled him to achieve the most remarkable results.

Pereira's pupils were drawn from all the social classes, and early in his teaching career he decided that the range of the education he provided should as far as possible be determined by the probable future needs of each pupil in the rank of life to which he belonged. Accordingly for those of the poorer classes he arranged a short course of instruction[35] which enabled them to communicate intelligently with their fellows for all essential purposes, and so fitted them to take their places in the everyday world of work. For pupils from

[35] "Un enseignement limité aux besoins vulgaires, pour la classe la plus nombreuse et la plus pauvre; enseignement qui s'accomplissait en moins de quinze mois." Séguin, *op. cit.*, p. 334.

the wealthier classes he arranged a much longer course.[36] When they had acquired some facility in reading, writing and speaking he devoted greater attention to their higher moral and intellectual education. He proceeded slowly and carefully, and with amazing patience and perseverance, from the known to the unknown, from the simple to the complex, from the concrete to the abstract. The manner in which he triumphed over the numerous difficulties he encountered in the process of familiarising his pupils with general and abstract intellectual and moral ideas approaches the marvellous.

Saboureux, from one of whose letters we have quoted above, refers to the extreme difficulty presented by such ideas, a difficulty which " est de nature à rebuter et le maître et l'élève." In arranging a curriculum for those who took his longer courses Pereira endeavoured to approach as nearly as possible that in general use in the education of normal children of the same social class. To Saboureux and others he taught, for example, the mathematical and physical sciences, literature, history and geography. He also sought to inculcate in them a love of learning and to

[36] " Un enseignement également superieur dans l'ordre intellectual et dans l'ordre moral, pour les enfants de la classe aisée qui peuvent dépenser de quatre à cinq ans à s'instruire : moitié moins de ces que nous passons dans les collèges." *Ibid.*

encourage them to acquire it through their own efforts. In this he succeeded, most notably in the case of Saboureux, who assiduously continued his studies for many years after leaving Pereira's care. In this way he learned Latin, Italian and Hebrew. In a letter[37] written in 1770, when Saboureux was thirty-two years old, M. Bjoernstaehl, a Swedish professor, gives an account of a visit paid to him by "l'étonnant Saboureux de Fontenay." He found that the latter was about to commence the study of Arabic and other eastern languages "pour connaître la métaphysique des langues primitives." Pereira paid particular attention to the social aspects of the education of these pupils. He was acquainted with a number of families who were interested in his work and in the progress of his pupils. The latter accompanied him on his visits to these families and he induced them to enter freely into communication with the members of the household. He also encouraged them to pay visits unaccompanied and to mingle freely with normal people outside the school. There were almost daily many visitors to the school with whom the pupils were also afforded opportunities of communicating. The master did not encourage them to communicate frequently with one another, and absolutely forbade their doing so by means of

[37] La Rochelle, *op. cit.* pp. 462 and 463.

general gesture.[38] His great aim was to fit his pupils for ordinary social intercourse, and he realised that after they had acquired the means of communicating with normal people the most important factor in their progress was constant practice in the use of such means. He found that much free intercourse with one another tended to retard their progress, as in such circumstances very little intellectual effort was required and they were always inclined to rely exclusively on the ordinary resources "de la mimique générale."

Such, in broad outline, were Pereira's educational principles and practice. We may now turn to consider a few of his more notable individual achievements. The first of his successes to attract public attention was obtained in 1774 at La Rochelle, whither he had gone in the course of his business. There he heard of a Jewish boy of 13, named Aaron Beaumarin, who was a congenital deaf-mute, and who had apparently received no formal education of any kind. " Being interested in him, he taught him, in about a hundred lessons, to know and to name by certain signs, the majority of the letters, consonants and vowels, and even to articulate several words and common phrases. And it must be added that these lessons were daily interrupted by the demands of the manual labour

[38] Laurent de Blois : *La Parole rendue aux Sourds-muets*, etc. Paris, 1831; p. 13.

imposed upon this child who had been set to learn the trade of a tailor. Great was the surprise throughout the town at the news that a Spaniard had a secret for the teaching of congenital deaf-mutes to speak. A day was fixed for the proof of this fact by a public test, and a meeting for those who were interested was arranged at the Jesuits' institution, in the hydrography room . . . . M. Dupaty (a member of the La Rochelle Academy, who was present) declares that in this public test, and in others which were repeated several times in different places, young Aaron Beaumarin, deaf and dumb from birth, and well-known as such, not only pronounced the following words: *Chapeau, madame, vaisseau, Que voulez-vous?* but also others quite new to him which were suggested at random."[39]

There was present at this meeting one M. d'Azy d'Etavigny, a wealthy citizen of La Rochelle who held high social and official rank in the town. He had a congenital deaf-mute son, then about 15 years old, and was therefore keenly interested in the proceedings. His son had undergone a special course of instruction extending over a period of ten years but had never learned to pronounce a syllable, and could communicate with others only by means of signs. A year later he was entrusted to Pereira under whom he made rapid progress. In a very

[39] La Rochelle, *op. cit.*, pp. 20 and 21.

short time master and pupil were presented to the members of the Caen Royal Academy at a meeting specially convened to receive them. A list was submitted to the meeting containing fifty words which young d'Azy d'Etavigny had learned to pronounce. The boy was examined by the members, who found that he could pronounce quite distinctly, with pauses between the syllables, such words as *épée, chemise, chapeau,* and that he gave clear evidence of his understanding of written questions and suggestions by intelligently responding with *oui* or *non.* An official certificate to this effect was presented to Pereira. It was at this meeting that he delivered the address to which reference was made on an earlier page.[40] In 1749, Pereira and d'Etavigny were presented to the Royal Academy of Sciences, which appointed a committee of three to inquire into the attainments of the pupil and to examine the contents of a memoir submitted by the teacher. The three very distinguished commissioners were Buffon, author of *Histoire Naturelle,* one of the most famous men of his time; Antoine Ferrein, the celebrated anatomist and professor of surgery in the Collège de France; and d'Ortous de Mairan, a famous physician and mathematician, who had himself taught a deaf-mute with some success by Amman's method. These scientists most carefully examined

[40] *Supra,* p. 17.

the pupil and the memoir, and their detailed report affords abundant evidence of the soundness of Pereira's theory and the excellence of his practice, as well as of his great personal skill as a teacher. "We have verified by experiment," they state, "that this young deaf-mute reads and pronounces distinctly all kinds of French expressions; that he gives very sensible replies, both verbal and written, to familiar questions put to him either in writing or by signs; that he understands and promptly does that which is proposed to him by means of writing or by the manual alphabet which his master uses; that he repeats several prayers by heart; that he gives to nouns the gender, case and number which belong to them. He knows and correctly employs the pronouns in common use, and conjugates verbs, whether the consecutive order be proposed or whether the order of moods, tenses, persons and numbers be reversed; he has to exclude, however, the irregular and little known conjugations. He has an understanding, proportional to the rest of his knowledge, of participles, adverbs, prepositions and conjunctions, and he observes, in the construction of the phrase and in spelling, several rules with sufficient exactness. One even sees with surprise that he often corrects the written errors one makes in spelling or syntax; that notwithstanding the different pronunciation given to each letter and syllable he nevertheless

articulated them correctly; that he speaks in a loud or low tone at will, and that he differentiates in tone between a question and an answer, and between a prayer and a commandment. . . . We find that the progress which M. d'Azy d'Etavigny has made in such a short time very sufficiently proves the excellence of the method which M. Pereire follows in his instruction, and demonstrates the singular character of his ability in practising it; that there is every reason to hope that by this means congenital deaf-mutes can not only pronounce and read all kinds of words and understand the full meaning of those which designate visible things, but can even acquire abstract and general ideas which they now lack, and can become sociable, capable of reasoning and acting in the same manner as those who have lost their hearing by accident after attaining the age of reason. . . . We think also that M. Pereire's manual alphabet, for which he employs only one hand, will become, if he makes it public, as greatly convenient for his pupils and for those who desire to hold intercourse with them as it is extremely simple and rapid, and consequently easy to learn and use."[41] The publication of this report by the *Mercure de France,* the *Journal des Savants,* and the *Journal de Verdun* attracted public attention, and there was widespread interest in Pereira and

[41] Quoted by La Rochelle, *op. cit.,* pp. 55 and 56.

his work. Louis XV himself was interested and granted an interview to teacher and pupil, to the former of whom he made a gift of 800 livres. Later he granted him a royal pension of 800 livres per annum. It is worthy of note, too, that le duc de Chaulnes, who had presented him to the King, conceived the idea of establishing a chair for Pereira in the Collège de France so that he might train teachers in the theory and practice of his method. Unfortunately this project came to naught.

It was le duc de Chaulnes who introduced to Pereira his most famous pupil, Saboureux de Fontenay, to whom we have already referred and from whose letters we have quoted. He was presented to the Royal Academy of Sciences in January, 1751, and that body entrusted his examination to the same three scientists who had inquired into the attainments of d'Etavigny. In the course of their report the commissioners said: "We have examined, by order of the Academy, the progress of the new pupil whom M. Pereire presented to it on the 13th of this month. . . . He already pronounces clearly and distinctly all letters, diphthongs, and syllables, not excepting the most complicated such as *blanc, franc, grand.* He recited the Lord's Prayer to the Academy and pronounced the names of several things which were indicated to him by signs, such as *chapeau, habit, bouton, épée.* . . . He already understands

the meaning of several familiar expressions in such a manner that, when given to him in writing, he carried out exactly such directions as *asseyez-vous, mouchez-vous, levez-vous, embrassez-moi, allez-vous-en,* and several others. . . . This statement shows that M. Pereire has a singular talent for teaching the congenitally deaf and dumb to speak and read, and that the method he uses must be excellent, children who have the use of all their senses not commonly making so much progress in such a short time."[42] We have noted previously the later achievements of Saboureux and the astonishing progress he made.

Marie Magdeleine Marois, who was mentioned above[43] in our extract from Séguin, was Pereira's best known female pupil. He began her education when she was seven years old, and her progress and ultimate attainments were almost as remarkable as those of Saboureux. By her letters, by interviews, and by her success in public tests she did much to enhance her teacher's reputation. Like Saboureux, she threw considerable light on Pereira's method, more especially in a long interview accorded to M. Laurent de Blois in 1828, when she was about eighty years old. On that occasion their prolonged conversation was entirely oral. One important question and her reply help to reveal

[42] *Ibid*, pp. 73 and 74
[43] *Vide* p. 29.

Pereira's method of conveying abstract ideas to his pupils. Even a translation clearly shows the real command of oral language which this lady had acquired. Question: To teach you the meaning of the words *bread, chair,* etc., he showed you the objects; but to make you understand the meaning of abstract terms like *courage, hope,* how did he proceed? Answer: He proceeded in various ways. Thus, it was raining, for example. Well, he showed us that perhaps to-morrow it would be fine, that he *expected* it would be, that he *hoped* it would be; hence the word *hope.* So with others.[44]

Perhaps enough has now been said to show that Pereira's contribution to the science and art of education was of considerable importance. Séguin declares that the following conclusions may be drawn from the results of his experimental and teaching work:

"1st. That the senses, and each one in particular, can be submitted to physiological training by which their primordial capability may be indefinitely intellectualized.

2nd. That one sense may be substituted for another as a means of comprehension and of intellectual culture.

[44] *La Parole rendue aux Sourds-muets,* etc. Paris, 1831; p. 5.

3rd. That the physiological exercise of a sense corroborates the action as well as verifies the acquisition of another.

4th. That our most abstract ideas are comparisons and generalisations by the mind of what we have perceived through our senses.

5th. That educating the modes of perception is to prepare pabulum for the mind proper.

6th. That sensations are intellectual functions performed through external apparatus as much as reasoning, imagination, etc., through more internal organs.''[45]

These are, of course, Séguin's own conclusions, formulated eighty-six years after the death of Pereira: and he does not appear to suggest that the latter was himself aware of these implications of his work. Pereira did, indeed, realise the great possibilities of sense-training as such and obviously appreciated many of the psychological effects of this training; but there is no conclusive evidence that he understood the direct connexion between sense training and mental development. He did not know that sense training is, as Professor Culverwell points out,[46] simply brain training. And what he regarded as the substitution of touch and sight for hearing was simply the development of the latent potentialities of the two former senses: this also

[45] *Idiocy: and its Treatment by the Physiological Method*, 1866; p. 20.

[46] *Montessori Principles and Practice*, 1918; pp. 51 59.

was sense-training and, therefore, brain-training. Nevertheless, his thought and work, rightly interpreted, are of great value to the student of education. They are both instructive and suggestive. And through his great influence on Séguin, who in his turn so profoundly influenced Dr. Montessori, present day educational thought and activity are indebted to him for much that is of real value. Educators of to-day are devoting increasing attention to the physiological aspects of their subject, to the question of sense-training, and to the study of the individual pupil. They are interested in the question of habit formation and in the interrelations of educational activities. Upon all these the work of Pereira sheds much light. In at least one other important particular he anticipated twentieth century ideas and practice. To-day we insist that the teacher must so direct the pupils' pursuits as to keep them in touch with *felt needs*;[47] that " if we desire our children to grow rational, *i.e.* to see the relations of cause and effect in daily life, then we shall always be seeking to base our scholars' activities on the most direct motives which lie within their grasp.[48] Pereira's practice was in complete accord with this view. The ordinary needs of life, the attractions of environment, the good and pleasant things they might obtain—these

[47] Professor J. J. Findlay: *The School*, 1911, p. 201.
[48] *Ibid.*

were skilfully used by him to induce his pupils to learn and practise the arts of speaking and reading and writing.

But not only along that road of progress which has led to the Montessori Method have the results of Pereira's work come down to us. Some of them have come by another and very different avenue—through the work and influence of Jean Jacques Rousseau. Séguin says: "When Pereire was implicitly solving all these problems by his demonstration on the deaf mutes of the identity of all our senses, he was in communication with Jean Jacques Rousseau, both living near each other in the Rue de la Platrière, which has since received the name of one of them. Pereire had his school of ten to fifteen deaf-mutes there, and Rousseau was in the habit of coming in, in a friendly, neighbourly manner. It would be presumptuous to suppose what transpired between these two men, so much unlike their contemporaries. Rousseau so shy, but so extremely eccentric; Pereire so modest, but so intensely individual; both sincere monotheists in an atmosphere of incredulity; both intent upon their favourite subject, civilization in its surest form, education. But in looking closely at their literary relics, we may more easily find ideas of Pereire in the *Discours sur l'Inégalité des Conditions,* than ideas of Jean Jacques in the memoirs on the restoration of the speech to congenital deaf-mutes, inserted

in the collection of the French Academy. However, no one can doubt the reciprocal influence two such master spirits must have exercised upon each other. The book of *Émile* is full of experiments upon the physiological teaching which could only have originated in the school for deaf-mutes; so identical are the theories of the book with the practices of Pereire."[49] Although this last sentence is obviously a somewhat exaggerated statement, there can be no doubt as to Rousseau's indebtedness to Pereira for many of his physiological ideas. As affording some evidence of this Dr. William Boyd directs attention to the following passage from the section of *Émile* which deals with the training of touch: "As touch when trained takes the place of sight, why should it not to some extent take the place of hearing, seeing that sounds set up vibrations in sonorous bodies, which are appreciable by touch? By placing the hand on the body of a violoncello, one can distinguish without the help of eye or ear, merely by the way in which the wood vibrates and trembles, whether the sound given out is sharp or flat, and whether it is drawn from the treble string or the bass. If only our touch were trained to note these differences, I do not doubt but that in time we might become so sensitive as to hear a whole tune with our fingers."[50]

[49] *Idiocy*, etc., pp. 20 and 21.

[50] *From Locke to Montessori*, 1917; p. 42. Quoted from *Emile*, Everyman edition, II., p. 103.

It is very strange that the name and remarkable achievements of Pereira were allowed to sink into oblivion. Séguin, writing in 1847, says, in a passage which would be marred by translation : " Il y a aujourd' hui cent ans que Pereire a montré en France le prodige de sourds de naissance auxquels il avait appris à parler ; que Buffon proclaimait, devant l'Académie royale des Sciences, Pereire l'homme unique, l'homme nécessaire de cet art inconnu ; que la Société royale de Londres ouvrait ses rangs à Pereire, dont le nom venait d'être inscrit dans l'Histoire naturelle ; et le nom de Pereire est oublié, et sa méthode est perdue ! "[51] Three main reasons may be suggested in explanation of these facts. In the first place his method, which had for its end the teaching of articulate speech, demanded from everyone who practised it the greatest patience, perseverance and personal power as a teacher ; while the method used and advocated by his greatest rival, the Abbé de l'Epée, and others, which was based on gesture and manual signs, and had for its highest end the teaching of written language, presented no very great difficulties to its practitioners. The influence of the powerful Abbé, who held that the education of deaf-mutes was a great Christian duty, won popularity and official recognition for his own method, and his school was elevated to the dignity

[51] *J. R. Pereire,* etc., p. 5.

of the National Institution for the Deaf and Dumb. In the second place Pereira was a foreigner and a Jew, facts of which the patriotic supporters of the Abbé took full advantage. It was often suggested that as a foreigner he was teaching his pupils to mispronounce the French language, while as a Jew he could not and would not teach the Christian faith. And finally, Pereira, carrying on his work under the jealous watchfulness of his rivals, determined to keep secret from his contemporaries his essential principles and practice. In doing so he was not in any way running counter to the spirit and custom of his time.[52]

52 "On voit d'ailleurs par les nombreux écrits du temps où il est question de l'art de Pereire, que personne ne se montre surpris de sa conduite inventeur et que ce n'était pas là un fait isolé et en opposition avec les mœurs." Félix Hément, *Jacob Rodrigues Pereire*, etc., 1857, p. 25.

CHAPTER II

JEAN MARC GASPARD ITARD (1775—1838)

JEAN MARC GASPARD ITARD was born and spent the first seven years of his life in the little town of Oraison in old Provence, a province which is now included in the department of Basses-Alpes. When one considers the great reputation of this physician and surgeon, whose distinguished career extended well into the nineteenth century, one is disappointed and surprised at the paucity of available biographical materials, especially in relation to his early years. In 1782, at the age of seven, he went to reside at Riez with his paternal uncle, a canon of the old Gothic cathedral in that town. This uncle, who had undertaken to superintend his education, sent him to the local *collège,* where he received the earlier part of what seems to have been a sound secondary education. Later he was sent to Marseilles to finish his studies at the school conducted by the Fathers of the Oratory of Jesus. The French Oratorians were liberal in their educational views, especially in regard to the cultivation of individuality, the teaching of the vernacular,

and the provision made for scientific studies, philosophy and history, as well as for the traditional rhetorical training in Latin and Greek. Thus young Itard, although his school career apparently ended at the age of 16, enjoyed many educational advantages, and as very probably his special aptitudes and tastes were recognised and fostered by the Oratorians, he no doubt laid in the Marseilles school the foundations for his subsequent scientific and philosophical studies. On the completion of his school education he returned to Riez where he remained for two years with his uncle, "*qui se fit un titre de son ministère pour diriger l'éducation de son neveu.*"[1] His father had destined him for a business career and had made arrangements for his entering one of the greatest banks in Marseilles, "espérant que le spectacle d'une grande fortune agirait plus efficacement que ses paroles sur la tête d'un jeune homme." But the exigencies of the crucial national situation effectually prevented the realization of all such hopes. In 1793 Revolutionary and Republican France found arrayed against her almost the full fighting force of England and the rest of Europe: and in the following year the National Convention issued a peremptory call to the colours which especially affected all male subjects from eighteen to twenty-five years of age.

[1] A. Bousquet: *Eloge Historique de M. Itard,* 1839: *Bureaux du Progrès Médical reprint,* 1894: p. xi.

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The two elder Itards, ignoring the claims of patriotism, determined to save if possible their only son and nephew, who was then 19, from the rigours and dangers of military service. The Director of the Toulon military hospital, which had been temporarily transferred to Soliers, was a citizen of Riez and a friend of Canon Itard's. To him the Canon introduced his nephew with an urgent request that he would employ the latter " dans le service de santé." The request was granted and Jean Marc Gaspard, who had never previously set foot in a hospital or opened a book on medicine or surgery, entered upon his life's vocation as a surgeon of the third class. He immediately entered upon his professional duties and study with remarkable enthusiasm and assiduity. At that time the famous military surgeon, Larrey, delivered a course of public lectures in Toulon on anatomy and surgery, and Itard attended the course as an eager and diligent student. In 1796 Larrey returned to Paris whither he was followed by Itard who enrolled as one of his regular pupils at the Val-de-Grâce. Soon afterwards he competed successfully for a position as second-class surgeon at the Val-de-Grâce ; but on being ordered to take a post elsewhere he resigned, as he was anxious to remain in Paris because of the numerous advantages it offered for professional study, observation and practice.

At that period there were in Paris two leading schools of medical thought, opposed to each other not only as to theory and practice but also as to the methods and aims of medical education and training. Of these two schools Corvisart and Pinel were the acknowledged chiefs. Corvisart advocated the direct clinical and observational study of diseases and general bodily ills with the simple purpose of discovering and applying the most effective means of curing them. He was not interested in the philosophical aspects of his subject, and for his students' reading prescribed only the works of distinguished practitioners like Sydenham and Stoll. Pinel on the other hand, was a philosophical physician who devoted much attention to theories, perceived that there was a real science of medicine and surgery, condemned empiricism, held that medicine was a branch of natural history, and advocated the study of the causes and real nature of diseases as well as their symptoms and effects. On quitting the Val-de-Grâce Itard, with his keen scientific and philosophic mind, naturally enrolled himself among the students of Pinel, and continued to pursue his advanced studies under the guidance and inspiration of that distinguished teacher.

He was then living in the Faubourg St. Jacques in the immediate vicinity of the National Institution for the Deaf and Dumb, to the founding of which

we briefly referred in the previous chapter. One day an inmate of the institution met with an accident which required a surgeon's attention, and Itard was called in. It was felt by the governing body that the National Institution should have its own medical officer, and on the advice of the Director, Abbé Sicard, Itard was appointed. Dr Montessori is thus mistaken when she states that he was connected with "the institute for deaf-mutes founded in Paris by Pereira."[2] The fact is, as we have seen in our first chapter, that Pereira himself did not *found* any institution: " L'école Pereire s'ouvrit, en effet, le 15 août 1875, dans une maison de l'avenue de Villiers" ;[3] and was founded by a society under the presidency of M. Félix Hément. And it was not established till thirty-seven years after Itard's death. The helplessness of the unfortunate inmates of the Institution appealed very powerfully to Itard, and with characteristic enthusiasm and thoroughness he applied his talents to the study of deaf-mutism in the hope of discovering means of curing it, or at least of minimising its effects. We shall return later to a brief consideration of his work in this field. At present we must turn our attention to his wonderful work in connexion with the education of the wild boy of the woods, " The Savage of Aveyron."

[2] *Montessori Method,* p. 33.
[3] La Rochelle: *J. R. Pereire,* etc., p. 558.

Towards the close of the year 1798 three sportsmen who were in the woods of Caune, in Aveyron, in Southern France, came suddenly upon a naked boy. In the manner of a wild creature he fled precipitately at their approach. They gave chase and eventually succeeded in capturing him as he was climbing a tree to evade their pursuit. The sportsmen took their strange captive to a neighbouring village where they entrusted him to the care of an elderly matron. Within a week, however, he escaped to the woods and hills, and during that very rigorous winter lived in the open, clad only in a tattered shirt. At night he apparently retired to some solitary place, but during the day often approached a village. At last one day of his own accord he sought shelter in a house in a village of the Canton of St. Sernin, and here he was detained and cared for during some days. He was then taken to the hospital of St. Afrique whence he was soon removed to Rodez where he was kept for several months. " During his abode in these places he appeared to be always equally wild, impatient of restraint, and capricious in his temper, continually endeavouring to get away, affording materials for the most interesting observations, which were collected by a person of the utmost credit."[4] This " person of the utmost

[4] Itard: *An Historical Account of the Discovery and Education of a Savage Man:* London, 1802; pp. 14 and 15.

credit" was Bonaterre, Professor of National History in the Central School of the Department of Aveyron, who had very closely observed and studied the wild boy, and who in his *Notice Historique sur le Sauvage de l'Aveyron,* published in 1799, described him as unused to our food, selecting his aliments by smell, lying flat on the ground and immersing his chin in the water to drink, tearing all sorts of garments and constantly endeavouring to escape, walking often on all fours, fighting with his teeth, giving very few marks of intelligence, having no articulate language and even appearing devoid of the natural faculty of speech, but kind, complaisant, and pleased at receiving caresses. Professor Bonaterre adds that "a phenomenon like this would furnish to philosophy and natural history important notions on the original constitution of man, and upon the development of his primitive faculties; provided that the state of imbecility we have noticed in this child does not offer an obstacle to his instruction."[5]

At length a clergyman who had won some distinction as a patron of science and literature, and who hoped that enlightened study of this boy might shed new light on the mental and moral science of man, obtained permission to have him brought to Paris at the end of 1799. Here he attracted a great deal of attention, not only from members of

5 Page 50.

learned societies and men of science generally, but also from ordinary citizens. "The most brilliant but unreasonable expectations," says Itard, "were formed by the people of Paris respecting the Savage of the Aveyron before he arrived. Many curious people anticipated great pleasure in beholding what would be his astonishment at the sight of all the fine things in the capital. On the other hand, many persons eminent for their superior understanding, forgetting that our organs are less flexible and imitation more difficult in proportion as man is removed from society and the period of his infancy, thought that the education of this individual would be the business of only a few months, and that they should very soon hear him make the most striking observations concerning his past manner of life."[6] Most of those who saw him, however, after the most superficial examination or casual observation abandoned all hope of civilizing him. For all they saw was a "disgusting, slovenly boy, affected with spasmodic and frequently with convulsive, motions, continually balancing himself like some of the animals in the menagerie, biting and scratching those who contradicted him, expressing no kind of affection for those who attended upon him; and, in short, indifferent to everybody and paying no regard to anything."[7]

[6] Itard: *op. cit.*, pp. 16 and 17.
[7] *Ibid.*, 17.

In a very short time the popular curiosity concerning the savage subsided, but he long remained an object of great interest, and even a subject of controversy, among the learned. The Governors of the National Institution for the Deaf and Dumb decided to keep him there, and Abbé Sicard, the Director, endeavoured to educate him. The learned Abbé, however, soon abandoned his attempts, and it would seem that the boy was merely given food and shelter until at last he was handed over to the care of Dr. Itard, and the great educational drama began.

From his distinguished teacher, Professor Pinel, one of the foremost medical authorities in France —especially on idiocy and other mental defects— Itard received no encouragement in the great task he had undertaken. In a report which he prepared for the Academy of Sciences, Pinel, notwithstanding some unimportant reservations due to his characteristic attitude of philosophic doubt, expressed the opinion that the boy was an incurable idiot, utterly incapable of profiting by education. Pinel's report does not appear to be obtainable now, but the following brief résumé of its contents is given by Itard himself: "Beginning with an account of the sensorial functions of the young savage, Citizen Pinel represented to us his senses as in such a state of inertia that this unfortunate youth was found, according to his report, very

inferior to some of our domestic animals. His eyes were without steadiness, without expression, wandering from one object to another without fixing upon anything; so little instructed in other respects, and so little experienced in the sense of touch, that he was unable to distinguish between an object in relief and a painting: the organ of hearing was alike insensible to the loudest noises and to the most charming music; that of the voice was still more imperfect, uttering only a guttral and uniform sound: his sense of smell was so little cultivated that he seemed to be equally indifferent to the odour of the finest perfumes and to the most fetid exhalations; finally, the sense of feeling was limited to those mechanical functions which arose from the dread of objects which might be in his way. Proceeding to the state of the intellectual faculties of this child, the author of the report exhibited him to us as incapable of attention (unless as it respected the objects of his wants), and consequently of all the operations of the mind which depended on it; destitute of memory, of judgment, even of a disposition to imitation; and so bounded were his ideas, even those which related to his immediate wants, that he could not open a door, nor get on a chair to obtain food which was put out of the reach of his hand; in short, destitute of every means of communication, attaching neither expression nor intention to the gestures and motions of his body,

passing with rapidity, and without any apparent motive, from a state of profound melancholy to bursts of the most immoderate laughter; insensible to every species of moral affection, his discernment was never excited but by the stimulus of gluttony; his pleasure an agreeable sensation of the organ of taste, his intelligence a susceptibility of producing incoherent ideas connected with his physical wants; in a word, his whole existence was a life purely animal."[8] Itard, while acknowledging the justness of Pinel's observations and the truthfulness of the dark picture he presented, remained quite undaunted by the magnitude of his self-imposed task, maintained that the boy was not an incurable idiot, and at once proceeded to study his subject scientifically and to prepare a scheme of education.

First of all he turned his mind to a consideration of the philosophical aspects of the problems presented by the history and the physical and mental condition of his unique pupil. "I conceived some hopes," he says, "which were grounded on the two-fold consideration of the *cause* and the *possibility of curing* this apparent idiotism. I could not proceed without stopping an instant to dwell upon these two considerations. . . . If it was proposed to resolve the following metaphysical problem, viz., 'to determine what would be the degree of understanding and the nature of the ideas

[8] Itard: *op. cit.*, pp. 21 and 22.

of a youth who, deprived from his infancy of all education, should have lived entirely separated from individuals of his species' ; I am strangely deceived or the solution of the problem would give to this individual an understanding connected only with a small number of his wants, and deprived, by his insulated condition, of all those simple and complex ideas which we receive from education, and which are combined in our minds in so many different ways by means only of our knowledge of signs. Well! the moral picture of this youth would be that of the Savage of the Aveyron, and the solution of the problem would give the measure and cause of his intellectual state.''[9]

But although he was himself convinced that the boy's pitiable condition was entirely due to his having lived for years a wild and wandering life in the woods and being thus completely isolated from all the formal and informal educative influence of society, Itard fully realised the necessity of convincing the many men of science and others who were interested in his undertaking that the poor child had led that strange existence from his early infancy. For there were sceptics who asserted that the so-called *savage* was merely a poor silly child whom his disgusted and cruel parents had but recently abandoned in the outskirts of the Caune woods. As supporting his own theory Itard

9 *Ibid:* pp. 24 and 25.

pointed out the following facts: All the boy's habits bore the stamp of a wandering and solitary life. He displayed an unconquerable aversion from society and its customs, from its clothes, furniture, apartments, and modes of cooking food. His indifference towards the objects of civilised pleasures and factitious wants was complete. Again and again he manifested an impassioned desire for the freedom of the fields, and made so many attempts at escape that a constant watch or practical imprisonment became necessary. When wearing stockings and shoes his movements were remarkably awkward and slow, and he at all times found it impossible to conform to the normal grave and measured mode of walking. If allowed freedom, however, he displayed extraordinary swiftness of movement and showed a constant tendency to set off at a trot or a gallop. He had an obstinate habit of smelling at everything which came in his way, even at bodies which the normal person found quite inodorous. His mastication was most curious, being always accomplished by the hasty action of the *cutting* teeth. From this Itard argued, on the analogy of other animals, that his food had been chiefly vegetable; *chiefly*, because there was some evidence suggesting that he may have preyed on small animals. "A dead canary-bird was one day given him, and in an instant he stripped off its feathers, great and small, tore it open with his nails,

smelt it, and threw it away."[10] There were twenty-three scars all over his body, some being scratches and excoriations and some resembling the bites of animals. One very large and deep scar on the throat suggested the use of a sharp instrument, and pointed to the fact that those who abandoned him had attempted to murder him, had possibly left him for dead. When first caught he lived on acorns, potatoes and raw chestnuts, always eating the husks and skins. Finally, five years before his capture he had been seen in the woods, entirely naked, and flying at the approach of men; and this flight suggests that even then he had become habituated to a wild life. Thus for probably seven of his eleven or twelve years he had led his savage sylvan existence, and during that long period had completely forgotten all that he had learnt in the first four or five years of his life.

In his consideration of methods and means for the education of this singular being Itard could obtain no guidance from either medical or educational precedent. He knew the particulars recorded by Linnæus and Bonaterre concerning ten well-authenticated cases of both male and female human beings who had been found leading the lives of wild creatures. But none of these cases had been scientifically observed and studied. "Such was," he writes, " in those remote times the defective

[10] Itard: *op. cit.*, p. 28.

march of scientific studies, the mania for explanation, the uncertainty of hypothesis, the exclusiveness of abstract thinking, that observation was set at naught, and these precious facts were lost to the natural history of man. All that had been left by contemporary writers is reduced to some insignificant details, the most striking and most general result of which is that these individuals were not susceptible to any very marked improvement; doubtless because it was sought to apply to their education, without regard to the different condition of their organs, the ordinary system of social instruction."[11] Itard was thus compelled to rely upon his own educational theory and practice.

His statement of aims, in which are revealed his educational principles, he embodied in the following five main propositions :[12]

1. To attach him to social life by rendering it more pleasant to him than that which he was then leading, and, above all, by making it closely analogous to the mode of existence that he was about to quit.

2. To awaken the nervous sensibility by the most energetic stimulants, and sometimes by lively affections of the mind.

11 Itard : *op. cit.*, pp. 33 and 34. Also his *Premier Rapport sur le Sauvage de l'Aveyron: Bureaux du Progrès Médical reprint;* Paris, 1894; p. 12.

12 *Ibid.*

3. To extend the sphere of his ideas, by giving him new wants, and by increasing the number of his relations to the objects surrounding him.

4. To lead him to the use of speech by subjecting him to the *necessity* of imitation.

5. To exercise frequently the most simple operations of the mind upon the objects of his physical wants, and then to direct the application of them to objects of instruction.

For the attaining of his first object Itard mainly relied upon simple, humane, kind treatment. He avoided all direct interference with the boy's habits, and, within very wide limits, allowed him to indulge in whatever activities his instincts or his organic needs or the environment demanded or suggested. The authorities of the Institute confided him to the special attention and care of Madame Guérin who brought to her most exacting task a motherly patience and tenderness and the intelligence of an enlightened teacher. "So far from directly opposing his habits, she knew in some measure how to comply with them, and thus to answer the object proposed in our first general head." The boy's habits and activities were in the main concerned with only four dominant circumstances—sleeping, eating, doing nothing, and running about in the fields, or performing, when this last form of activity was impossible, strange convulsive and balancing movements. Itard felt that only by indulging him

within reason in connexion with these four sets of habits, tendencies and activities could his pupil be made happy. He was greatly affected by natural phenomena, which produced in him emotions of joy, sorrow, melancholy, attracted for the time his whole attention, and appeared to induce contemplation. We feel that the quotation of the following passages *in extenso* is justified not only by their value and interest for the student of the natural history of man, for the psychologist and the educator, but also because of the evidence they contain of Itard's enthusiasm, patient observation and earnest endeavour.

" If at any time a boisterous wind arose ; if the sun, concealed behind a cloud, suddenly burst forth, brilliantly illuminating the surrounding atmosphere, he expressed an almost convulsive joy by thundering peals of laughter, during which all his turnings, backward and forward, resembled very much a kind of leap he wished to take to throw himself out of the window. . . . One morning after a heavy fall of snow, as soon as he awaked he uttered a cry of joy, leaped from his bed, ran to the window, then to the door, going backwards and forwards from one to the other with the greatest impatience, and at length escaped half-dressed into the garden. There he exhibited the utmost emotions of pleasure ; he ran, rolled himself in the snow, and taking it up by handfuls devoured it with

an incredible avidity. . . . When the severity of the weather drove every other person out of the garden he delighted in taking a great many turns about it : after which he used to seat himself on the edge of the pond basin. I have often stopped for whole hours together, and with unspeakable pleasure, to examine him in this situation ; to observe how all his convulsive motions and that continual balancing of his whole body diminished and by degrees subsided, to give place to a more tranquil attitude ; and how insensibly his face, insignificant or distorted as it might be, took the well-defined attitude of sorrow, or melancholy reverie, in proportion as his eyes were steadily fixed on the surface of the water, and when he threw into it from time to time some remains of withered leaves. When, on a moonlight night, the rays of that luminary penetrated into his room he seldom failed to wake out of his sleep and to place himself before the window. There he remained during a part of the night, standing motionless, his neck extended, his eyes fixed towards the country illuminated by the moon, and carried away in a sort of contemplative ecstasy, the silence of which was interrupted only by deep-drawn inspirations, after considerable intervals, and which were always accompanied with a feeble and plaintive sound.''[13]

13 Itard : *op. cit.*, pp. 41 and 42. *French reprint*, p. 15.

Itard felt that it would be futile and lacking in kindness and consideration to oppose or even to restrain unduly the habits described in these extracts. He adopted, on the contrary, the plan of general and reasonable compliance with them, always seeking through them to establish simple but definite intercourse between the pupil and his new environment. Very slowly, by almost imperceptible gradations, some progress was achieved. The boy slept at more regular times and for shorter periods: his gluttony and his rough and ravenous mode of eating at frequent intervals gradually gave place to moderation in quantity, regularity of meal times, and gentleness of manners: his convulsive motions and uncouth balancing movements were gradually abandoned, while his power of co-ordinating activities increased: and as that power developed, his marked idleness was replaced by a more normal alteration of activity and rest. Thus was Itard's wise and humane procedure justified. Even the slow progress of his pupil greatly encouraged his belief that he could now render "ses journées plus profitables à son instruction." It must be carefully noted that in his detailed account of the boy's education Itard does not observe a chronological order. The portion of his Report which recounts his own educative efforts is arranged in five sections, each section describing the ways and means used in endeavouring to achieve one of

the five chief objects stated above. A disadvantage of this arrangement is that points of progress along different lines of development which were reached about the same time, as well as events and experiments that were approximately contemporaneous, are described in different parts of the Report. Nor did Itard take pains to provide cross-references.

In his efforts to achieve his second object—to awaken the nervous sensibility by the most vigorous stimulants and occasionally by lively affections of the mind—Itard, after prolonged and patient use of experiment and expedient, met with considerable success. At first the boy's sensibility was remarkably low. He would sit half-naked on the wet grass and remain exposed for hours to wind and rain. And not only to great cold and humidity did his skin or sense of touch manifest no apparent sensibility; they also seemed indifferent to great heat. When near the fire he frequently seized in his hand live coals that had fallen from the grate and imperturbably replaced them. He was particularly fond of potatoes, and was often found in the kitchen calmly lifting them out of the boiling water and squeezing them to test whether they were sufficiently soft. He ate roasted specimens straight from the fire. Yet his skin was of very fine and delicate texture. He was induced to take large quantities of snuff, but it produced in him not

the slightest tendency to sneeze. Itard states that the result of this snuff experiment proved that in his pupil the natural sense sympathy among the organs of smell, respiration and sight was altogether lacking. He included sight because the snuff produced no tears. Indeed, it was not until his education had continued for several months that he indulged in tears, despite all his obvious troubles and trials. His ear seemed the most insensible of all his organs and senses. As Professor Pinel had stated, it was insensible alike of the loudest and the most harmonious sounds of civilization. Two pistol shots were fired close to his head: the first produced some slight emotion, but at the second he merely turned his head with apparent indifference. And yet the cracking of a walnut, of which fruit he was very fond, immediately attracted his attention. Itard deals more fully with the sense of hearing in his fourth section, in which he relates how he endeavoured to teach his pupil to speak.

To overcome this insensibility several expedients were used. The pleasant effects of warmth proved very potent for this purpose. The boy was provided with comfortable clothing, a warm room, and a cosy bed. He was kept in a hot bath for two or three hours every day, while water of the same temperature as the bath was frequently dashed on his head. This strenuous treatment was not followed by the usual debilitation, a fact which some-

what disappointed Itard who believed that a loss of muscular force would be attended by a gain in sensibility. Gradually, however, the pupil grew to like warmth and to dislike cold. He began to notice variations in the temperature of the bath water. Before getting in he would test its warmth with his hand, and if not satisfied would refuse to enter it. Soon also he began to appreciate the value and use of clothes. He was left in the cold, but with clothes placed near him, and in a few days had found out how to put them on. Later his growing appreciation of the comfort of clothes and bed led to improved personal hygiene, especially at night. The application of dry frictions to the spinal vertebræ and titillation of the lumbar regions were next tried. The latter activity undoubtedly stimulated sensibility, but it had to be abandoned through fear of physiological complications connected with possible premature puberty.

When attention was directed to the excitement of his mental affections it was soon realised that only two—anger and joy—were available. At distant intervals his anger was provoked in order to rouse his mental powers. "I sometimes remarked," says Itard, "that at the moment of his most violent indignation his understanding seemed to acquire a temporary enlargement which suggested to him some ingenious expedient for freeing himself from disagreeable embarrassment. Once as we were

endeavouring to persuade him to make use of the bath when it was only moderately warm our repeated and urgent entreaties threw him into a violent passion. In this temper, perceiving that his governess was not at all convinced, by the frequent trials which he had himself made with his fingers, of the coldness of the water, he turned back towards her in a precipitate manner, seized her hand and plunged it with his own into the bath."[14] On another occasion when Itard endeavoured to make him touch a Leyden jar by getting him into a corner from which there was no escape except by seizing the jar to remove it, he very dexterously twisted the doctor's wrist so that the latter received the shock. It was very easy to give him joy. A sun ray reflected by a mirror on the ceiling, the dropping of water on his finger tips while he was in the bath, the sight of a wooden porringer, containing a little milk, floating in the bath and moved along by the oscillations of the water—all these led to shouts of joy and the clapping of his hands.

After three months his sensibility had greatly increased in three of the organs of sense. He derived marked pleasure, through his developing sense of touch, from passing his hand over the doctor's velvet pantaloons; and learned to judge by touch whether or not his potatoes were sufficiently cooked. He had learned to light a candle

[14] Itard: *op. cit.*, p. 52. *French reprint*, p. 19.

with a piece of paper, and the marked increase in his sensibility was shown by the care he took to avoid burning his fingers. When at this stage he was made to push or carry heavy or hard objects he would often hurriedly withdraw his hands and carefully examine his finger tips, afterwards placing them in the opening of his waistcoat—a favourite gesture. His sense of smell had also greatly improved during this period. Snuff now became effective and he sneezed readily. Itard records his horror at his first sneeze : the poor boy was so agitated that he threw himself on his bed in terror. It was evidently an altogether new experience for him. His taste, too, and his appreciation of daintiness had developed considerably. We have seen how savagely and disgustingly he used to eat : but after three or four months he would throw away the contents of his plate if he noticed any dust or dirt upon it. He would still break walnuts under foot, but would take pains afterwards to clean them in the most delicate manner.

Another sign of his progress was that he began to contract very violent colds. A remarkable fact, however, was that these colds did not in any way affect his eyes or ears. From this the doctor argued that they required further education, as their sensibility had not been increased. His concluding remarks concerning this fact are worthy of note : " The simultaneous improvement of three

senses that was produced in consequence of the stimulants applied to the skin, at the same time that these two last remained stationary, is an important fact and deserves particular attention from physiologists. It seems to prove, what from other sources appeared not improbable, that the senses of touch, of smell and of taste are merely different modifications of the organ of the skin; while those of the ear and the eye, being less exposed to external impressions, and enveloped with a covering much more complicated, are subject to other laws of amelioration and ought on that account to be considered as constituting a class perfectly distinct."[15] The reader will perceive that here Itard had failed to realise the fundamentality of the sense of touch. In this connexion his knowledge and physiological insight fell very far short of those of Pereira, of whose work he was apparently, and very unfortunately, almost completely ignorant. Séguin, as we have seen,[16] showed that by his discovery Pereira " demonstrated to the physiologists of his day that *all* the senses are modifications of the tact, *all* touch of some sort." We have also seen[17] that Miss Anna Sullivan, Helen Keller's teacher, pointed out that " psychologically, and as a matter of biological history, hearing and sight are only specializations of the sense of touch."

[15] *Op. cit.*, pp. 59 and 60.
[16] *Vide* Ch. I., p. 30.
[17] *Ibid*, p. 32.

Itard encountered immense difficulties in his endeavours to attain his third object—to extend the sphere of the boy's ideas, by giving him new wants, and by increasing the number of his relations to the objects surrounding him. Toys of many sorts were presented to him, and tedious hours were spent on efforts to teach him how to use them. All such efforts, however, only made him fretful and impatient; and at the first favourable opportunity he would conceal or destroy the toys. On one such occasion he burned a set of nine pins, taking very obvious delight in the process. Considerable success attended the use of one simple device. A number of little silver goblets were inverted and placed in irregular order on the table, and a chestnut was placed under one of them. With the exception of this one the goblets were raised in turn: and the boy was then invited to look for the nut. He always chose the right goblet at once. Itard concluded from this that his pupil was exercising attention and memory and showing simple reasoning power. A still more satisfactory result was obtained when the exercise was made more difficult. The goblets were arranged irregularly as before with a nut under one of them: then the order was *slowly* changed while the boy watched. Again he was able to locate the nut. Next a nut and two other objects were placed under a goblet, and although he then had three goblets to attend

to and remember while the order was being changed, he succeeded in finding the nut. Believing that so far the instinct of gluttony had been the great incentive to attention, Itard determined to continue the experiment while relying on amusement to provide the incentive. He now placed only inedible objects under the goblets, and was greatly gratified to find that the results were " nearly as satisfactory" as before. The pupil's powers of attention and of judgment were undoubtedly developing. But failure attended all attempts to cultivate in him the tastes proper to his age, and he could not be induced to indulge in childish games or to make use of any kind of plaything.

It was next sought to create in him new wants by developing the finer pleasures of the palate. Great difficulties here presented themselves, however, for he displayed a strong aversion from sweetmeats and the most tender and delicate viands. Stimulating foods were used to try to overcome the palate dulness produced by the gross fare of his wild life, but without success : and even when obviously suffering from hunger and thirst he refused the finer foods and all kinds of strong liquor. It appeared clear that no *new* tastes could be produced, and Itard decided to try the effect of developing existing tastes by the aid of pleasant and attractive accompanying circumstances. Here he was rewarded by very satisfactory results. His

method was to take the boy to dine with him somewhat formally in the city, and his account of this experiment is both entertaining and instructive: "The first time that he was at such a feast he expressed transports of joy which rose almost to frenzy. No doubt he thought he should not sup as well as he had dined, for he did not scruple to carry away in the evening, on his leaving the house, a plate of lentils which he had stolen from the kitchen. I felt great satisfaction at the result of this first excursion. I had found out a *pleasure* for him; I had only to repeat it a certain number of times in order to convert it into a *want;* this is what I actually effected."[18] And other pleasures led to wants. He could not be kept in proper order in the streets: his custodian either had to run with him or use force to restrain him. So it had to be arranged that he should go in a carriage; and this mode of taking the air proved to be a real want-producing pleasure: "In a short time these days ceased to be merely days of feasting, in which he gave himself up to the most lively joy; they absolutely became real wants, the deprivation of which when the interval between them was a little longer than usual, rendered him low-spirited, restless, and fretful."[19] In contrast to all this, when he was taken to the country for

[18] *Op. cit.*, p. 68.
[19] *Ibid*, p. 70.

a few days he manifested a keen desire for flight to the woods and hills, to which he seemed irresistibly drawn. He would rise frequently from the table and rush to the window as if to escape. It was thus found necessary to abandon country visits, for which were substituted walks in the Observatory Gardens. Gradually he became attached to his new activities and began, too, to show affection for and dependence on his governess: "Once having slipped from her in the streets, on seeing her again he burst into a flood of tears." And in themselves these tears were clear evidences of his progress. He showed affection for Itard, also, especially on occasions when the latter was not engaged in testing or teaching him. There is no doubt that there had arisen for the boy a number of new wants that were connected with the presence and the help of Madame Guérin and Itard.

The attainment of Itard's fourth and most difficult object—to lead him to the use of speech through compelling imitation " par la loi impérieuse de la nécessité"—was prevented by insurmountable obstacles. And although he ends with an expression of hope the fourth section of his Report he begins it thus: " If I had wished to publish only successful results I should have suppressed this fourth section of my work, the means which I made use of in order to accomplish my object as

well as the little advantage I derived from them. But my intention is not to give the history of my own labours, but merely that of the progressive developments which appeared in the mind of the Savage of Aveyron; and of course I ought not to omit anything that can throw light on his moral history." The great obstacle was the insensibility of the ear to the peculiar sounds of his new environment. During his forest life had had gained "ear-impressions" from only a small number of sounds, and these such only as were connected with his safety and physical needs. There had never then been any need for him to discriminate human articulation. For about a year he seemed to gain no impressions whatever from such sounds of civilization as were not directly associated with his wants: but for those sounds that were so associated his ear possessed an exquisite sensibility. If a nut were gently and cautiously plucked from a tree, or if the key of a door which kept him confined were quietly turned, he heard instantly: but loud shouts or even pistol shots were unnoticed. "Our young savage feeling only a small number of wants, was induced to exercise his senses on only a small number of objects."

At last, however, slight development began, and he attended to human voices, which he seemed to associate with danger. When loud voices sounded outside his door he ran to it to see if it were secure,

and sometimes put his finger on the latch. He heard the guttural sounds made by the deaf-mute children and showed that he knew the direction whence they came by hurrying off the opposite way. Then he learned to *distinguish* the sound of *Oh,* apparently through hearing its frequent ejaculation in the course of a discussion conducted one day in very loud voices. Itard made numerous experiments based on his pupil's ability to distinguish this sound, and also decided to give him the name of *Victor,* which, as pronounced in French, has the stress on *oh.* When this name was loudly pronounced he rarely failed to attend to it. He next learned the meaning of *non* when used to indicate that he had erred in the performance of any exercise or task.

Thus far, however, Victor had remained mute, making no attempt to enunciate the one sound he could distinguish. Itard satisfied himself by careful examination that the mutism was not due to the severe wound in the boy's throat and that there was no structural defect in the organs of speech; and he concluded that the latter had become "inapt for their functions" simply through desuetude—through "growing and developing without the assistance of any agent that was calculated to call them into action." And although he was "convinced . . . that it was necessary only to excite by degrees the action of the larynx by the

allurement of objects necessary to his wants," he fully realised that very patient and very long-continued labour would be required to enable his pupil to speak. He noted with hope that the known sound *oh* corresponded with *eau,* the name for a frequently-recurring want: but all his efforts failed to induce Victor to sound *oh* when he wanted water. He next tried *lait;* and suddenly, on the fourth day, clearly, but in a rather harsh manner, the boy pronounced this word and repeated it again and again. Itard was not unduly elated, for he soon perceived that the word was not used to *express a want,* but only as an exclamation of *satisfaction:* Victor had not yet begun to acquire the true use of speech as a means of communication. His use of *lait* was subject to numerous misapplications; it expressed satisfaction, pleasure, joy, in the possession of *anything.* "After this first result," writes Itard, " I have totally renounced the method by which I obtained it; waiting for a time when local circumstances will permit me to substitute another in its place, which I think will be more efficacious, I have abandoned the organ of voice to the influence of imitation which, although weak, is not, however, altogether extinct, a fact which appears from some little advancement he has since made spontaneously."[20] From *lait* he learned two other monosyllables, *la* and *li,* to which he seemed to attach

[20] *Op. cit.,* p. 96.

even less meaning than to the first. Later he acquired a sort of liquid *l*, a sound which proves difficult for normal children. The acquisition of these later sounds which he very frequently repeated, Itard attributes to "une sorte d'intention en faveur du nom de *Julie*"—the name of Madame Guérin's little daughter who was then on a visit to her mother. From the mother, by spontaneous imitation, he next learned to pronounce *oh Dieu*, the latter word sounding like *Düe*. At last he acquired all the vowel sounds and those of *d*, *l*, and liquid *l*; and this Itard considered sufficient to demonstrate the possibility of developing his powers of speech.

Progress towards the acquisition of speech continued with exceeding slowness, being retarded, as Itard notes, "by the facility which our young savage shows in expressing in other ways than by speech the small number of his wants." If, for example, he wished to go for a walk he would move impatiently backward and forward from window to door, would lay before his governess all the necessary articles for her outdoor toilet, would urge her to dress, even trying to assist her, would hurry down stairs first and take hold of the latch. When he broke the cup in which he used to receive milk from the keeper at the Observatory Gardens he chose for himself a wooden vessel. When the doctor disordered his own hair and directed Victor's atten-

tion to it the latter fetched him a comb. It was comparatively easy to communicate with him by the "language of action": and no preliminary lessons in the use of any signs or gestures was necessary for his understanding of what was required. The following passage suggests how wide and useful was the range of applicability of his "language of action": "He is no less expressive in the manner of exhibiting the affections of his mind, and especially impatience and *ennui*. A great number of the curious know how, with more natural frankness than politeness, he dismissed them when fatigued with the length of their visits: he presents to each of them, and yet without a countenance of contempt, their cane, gloves and hat, pushes them gently towards the door which afterwards he violently shuts upon them."[21] Notwithstanding Victor's very slender linguistic attainments at the time this section of the Report was written, Itard concludes it with an expression of his belief that "des besoins plus multipliés" will make the boy feel the necessity for speech and compel its acquisition.

For the attainment of his fifth and last object—to exercise frequently the most simple operations of the mind upon the objects of his physical wants, and then to direct the application of them to objects of instruction—the means employed by the educator

21 *Op. cit.*, pp. 103 and 104.

consisted essentially in interposing between the boy and his wants obstacles that were continually increasing and changing and which he could not overcome without the constant exercise of his attention, memory and judgment, and all the functions of his senses. His sense of hearing had remained so deficient in sensibility that Itard decided to make use of the methods employed by Abbé Sicard in the education of deaf-mutes. He made drawings on a blackboard of scissors, a key, and a hammer, and then sought to form associations in the pupil's mind between the drawings and the real objects. When he thought this association had been formed he made a finger drawing of an object and showed the pupil that he required him to fetch it. He met with failure here, however, for Victor brought *all* the objects used in the exercises. Attempts were then made to direct his attention to the objects separately. Here use could be made of one of his wants—a want for order, especially of pictures or other things on the walls: whenever these were disordered he would rearrange them correctly, even getting out of bed to do so. The objects used were hung on the wall beneath their drawings, and left for some time. They were then taken down and given to the boy, who at once replaced them correctly. When, however, the order of the *drawings* was altered the *objects* were replaced, without regard for the

alteration, in their original positions, a fact which showed that the pupil was not using his judgment, but merely remembered the order of the objects. He was not *reasoning* about relationships.

Itard then determined to prevent the undue employment of mere memory, and concluded that the best means of reaching this end was so to increase the number of objects and drawings, and the frequency and complexity of the re-arrangements, that Victor could not by the aid of memory alone replace the things in any given order. Thus would arise a need for the exercise of judgment and reasoning: "the understanding must have recourse to a comparison of the design with the thing." The results of this experiment were very satisfactory. The boy would look closely at the objects in turn, and choose one, and then seek for the corresponding drawing beneath which to place it. The doctor's high hopes, based upon this considerable success, had to give place to disappointment, however, when he ascertained after earnest effort that his pupil could not possibly take the next step required by the Sicard method. This step consisted in placing behind the drawing of the object the letters forming its name, associating definitely the object, design and name, removing the design and allowing the *word* to represent the object. Poor Victor did not possess the average deaf-mute

child's powers of attention and observation or quickness in appreciating the inter-relations of visible things. So Sicard's method had to be abandoned and another invented.

This new method may be briefly described as follows: Itard obtained a board two feet square and pasted upon it three pieces of paper of very distinct outline and of very decided colours—a red circle, a black square, and a blue triangle. He also cut three pieces of pasteboard corresponding in size, shape, and colour to the figures on the board. The three pasteboard pieces were then hung over the paper figures by nails through holes in their centres, and were there left for some days. When at last they were taken down and given to Victor he was able to replace them correctly. He was also successful when the board was inverted, thus altering the order of the figures. In this exercise he was guided by both form and colour. The latter was eliminated as a guide at the next step, when the same three forms were used and all pieces were of the same colour. Once again the pieces were correctly replaced, as was also the case when they were all of the same shape but of different colours. Additional forms and colours were next introduced, while the difficulty of the exercise was still further enhanced by placing close together forms or colours that did not widely differ from one another. Very

gradually all difficulties were increased and the boy's powers of attending, observing, comparing, judging and reasoning slowly developed.

Unfortunately, however, there came a day when his patience and docility became exhausted, and he indulged in violent outbursts of fury if his teacher insisted upon the continuance of a difficult exercise. Itard decided that it was better not to try to appease him, but to overcome his wild rage by an unyielding insistence on the performance of his allotted tasks. When, therefore, he angrily threw the pieces on the floor and flung himself on his bed in a paroxysm of fury, the doctor, having allowed him to rest a few minutes, would sternly insist upon his gathering up the pieces and continuing the exercise. But this perseverance on the part of the teacher lasted only a few days, for the pupil's paroxysms became more frequent and more violent, culminating at length in convulsions like those of epilepsy. Itard determined to cure this form of epilepsy by some treatment that would produce a feeling of horror or extreme fear. Remembering an occasion when Victor displayed great terror on approaching the edge of a high parapet at the Observatory, he resolved to use for his purpose the obvious cause of that terror. And so when the boy next relapsed into a paroxysm of rage, " taking advantage of the moment when the functions of the senses were not as yet suspended," he suddenly opened a fourth

storey window looking down on a rough pavement, approached the patient with every appearance of anger, seized him roughly and held him out of the window, face downwards, for some seconds. When released he was trembling, was exceedingly pale and covered with cold sweat. But he was cured! He was at once made to gather up the scattered materials and proceed with his lesson. Thereafter there were no wild outbursts, his fatigue and unwillingness being henceforth expressed by a kind of bored impatience, plaintive murmuring or tears. Rougher outline drawings of objects and mere amorphous patches of colour were now used in the exercises, and after a time new difficulties actually became sources of amusement for the pupil.

The next forward step was one of very great importance. The twenty-four letters of the alphabet were printed on cards about two inches square which were then inserted in a board in such a manner as to be easily re-arranged. Another set of letters of the same size was made in metal and placed in the slots on top of the cardboard set. The pupil's task was to remove all the metal letters and then to replace them correctly. This he did at once with the greatest ease; but Itard perceived that he had found a way of doing it which did not involve any troublesome exercise of comparison or judgment. He simply removed the letters in alphabetic order, kept them in that order in a pile,

and then replaced them by commencing with the last. When, however, the pile collapsed he succeeded in re-arranging the letters correctly. Later he arranged them in four equal piles, still observing alphabetic order. The doctor did not know whether this procedure was the result of reasoning. It was routine, but it required invention and did honour to his intelligence. Afterwards the board was given him with the letters in disorder; but his powers of attention, comparison and judgment came into play and he always succeeded in restoring the order, even triumphing over the difficulties caused by the resemblance between *C* and *G* and between *E* and *F*. But Itard was keenly desirous of inducing him to use the letters as a means of expressing his wants: "Far from imagining that I was so near this grand epoch of his education, it was a spirit of curiosity rather than a hope of success which suggested to me the following experiment."[22] He arranged LAIT on a board, and in the morning, while Victor was impatiently waiting for his milk, Madame, acting as previously instructed, approached the board, looked carefully at the letters, and then handed the doctor a bowl of milk which he pretended was for his own use. Later he went to Victor and gave him duplicates of the four letters; then pointing to the word LAIT with one hand he held out the bowl of milk with the other. The

[22] *Premier Rapport*, etc., p. 46.

boy arranged the letters in inverted order, and not until he had been shown and had corrected his errors was he allowed to drink. After five or six lessons he always arranged these letters correctly, and very soon it became clear that he saw a relation between the correct arrangement and one of his wants. Eight days after the first trial he quite spontaneously provided himself with the four letters before setting out on his daily visit to the Observatory. Arrived there, and before he had received his usual gift of milk, he arranged them on a table to spell LAIT. And by this spontaneous act he convinced his teacher that he had arrived at the great epoch and had made a beginning, albeit a very small beginning, in the use of language as a means of expressing his wants.

At this point Itard ends the detailed portion of his first account of the wild boy's education. And content to rely for future development upon experiments and exercises similar to those which had achieved so much, upon time which works such wonders for childhood, and upon the advent of the pubertal crisis with its great mental and moral possibilities, he writes as follows: "In the meantime we have a right to conclude from our observations, especially from those which have been recorded in these two last sections, that the child known under the name of the Savage of Aveyron is endowed with the free exercise of all his senses,

that he gives continual proofs of attention, reflection, memory; that he is able to compare, discern and judge, and apply, in short, all the faculties of his understanding to the objects which are connected with his instruction. It is proper to remark that these happy changes have been produced in the short space of nine months, and in a subject who was supposed to be incapable of attention; hence we are authorised in concluding that his education is possible, if it is not absolutely demonstrated already by these early instances of success, independently of those that we may in future expect from time."[23] And contrasting his condition at the end of nine months with that during the first months of his residence in Paris, the doctor adds: "Those who have not observed him at that period and who see him at the present instant would perceive in him only a child that is nearly like other children, except that he does not speak; they could not be duly sensible of the important distance which exists between this being and the Savage of Aveyron just after he had been introduced into society, a distance in appearance trifling, but in fact immense when we properly reflect upon it and calculate through what a series of new reasons and acquired ideas he must have gone in order to have arrived at these last results."[24]

[23] *An Historical Account*, etc., pp. 139 and 140.
[24] *Ibid*, p. 142.

Finally, although the experiments and observations recorded in this first report extended over a period of only nine months, Itard submits that we may deduce from them the following five important inferences relative to the education of man and to his philosophical and natural history.

1. That man in a pure state of nature is inferior to many of the lower animals.

2. That the mental and moral superiority which has been said to be natural to man is merely the result of civilisation, which raises him above other animals by a great and powerful stimulus: this stimulus is the predominant sensibility of his species, the essential property from which flow the faculties of imitation and that continual propensity which forces him to seek in new wants new sensations.

3. That his imitative power, adapted for the education of all his organs and especially for the acquisition of speech, though very strong and active during the early years of life, is rapidly enfeebled by the progress of age, by isolation, and by all other causes which deaden the nervous sensibility: whence it follows that the power of articulating sounds—the most wonderful and useful result of imitation—can be acquired after the period of childhood only by the surmounting of almost innumerable obstacles.

4. That alike for the most isolated savage and the most highly civilised being there is a constant

proportion between *ideas* and *wants;* and that the continually increasing multiplicity of wants among civilised men must be regarded as a grand means for maintaining the progressive development of the human mind: " so that we may be allowed to lay it down as a general proposition that all the causes, whether accidental, local or political, which tend to augment or diminish the number of our wants contribute of necessity to extend or to contract the sphere of our knowledge and the domains of science, the fine arts, and social industry."

5. That in the light of physiological knowledge the progress of education can be, and ought to be, guided by medical science, which of all the natural sciences can co-operate most effectually in the advancement of mankind, through its appreciation of the organic and intellectual peculiarities of each individual and its use of that means to determine what education is likely to do for him and what society may expect from his future development.

* * * * * * *

For five years Itard remained silent concerning the educational progress of his pupil. At last in 1806, in response to a request by the Minister of the Interior, he wrote his second Report which completes the story of his great endeavour. At

some period during this long interval, probably in 1802, he would appear to have reached the conclusion that Victor was afflicted with idiocy, and that consequently his original diagnosis was wrong. He never openly acknowledged his error ; but in his *Mémoire sur le mutisme produit par la lésion des fonctions intellectuelles,* published more than thirty years later, he writes a warning against accepting as signs of perfectibility " some acts of a purely local intelligence," and among such signs instances those manifested by a child in connexion with his essential wants. Then he adds : " It is because I was once deceived that I make this observation."[25] And Bousquet remarks upon this : " A touching and naïve avowal, inspired, perhaps, by the recollection of the Savage of Aveyron ! Perhaps, we say, for we have not received his confidences in this matter ; too modest or too severe towards himself he liked not to recall the beginning of his career."[26]

His second Report described an altered educational scheme which was, as Séguin pointed out,[27] more fitted for an idiot than for a savage. Founded upon physiology, it made careful and detailed provision for

I. The development of the senses ;

[25] *Bibliothèque d'Education Spéciale Reprint of Itard's works,* 1894 : p. 113.
[26] *Ibid,* p. xviii.
[27] *Idiocy,* p. 18.

II. The development of the intellectual faculties;

III. The development of the effective functions.

"When the first philosophical programme of Itard had partly succeeded against what was savage in his pupil," says Séguin, "he conceived after Pereire and Rousseau, the physiological terms of his second one, which adapted themselves exactly to the functional incapacities of the idiocy of his pupil, so admirably described by Pinel; so that, *nolens volens,* the great teacher began to treat the idiot in the savage."[28] Down to 1802 Itard, as we have seen, believed that his pupil's condition was solely due to his having led a savage existence *in a state of nature,* and that the only difference between him and the normal child of the same age was that the latter had been developed by the educative agencies and influences of civilization. So his main object had been to adapt the organism to a civilized environment, chiefly through the media of its wants, and bring to bear upon it the developing force of these agencies and influences. That object was mainly philosophical. From the stand-

[28] *Idiocy,* etc., p. 21. If Séguin here suggests that Itard consciously followed Pereira he is undoubtedly in error. Itard knew very little of Pereira and his work. See his *Traité des Malades de l'Oreille,* 1821; Vol. II., p. 472. And with regard to Rousseau, Dr. Wm. Boyd points out (*From Locke to Montessori,* 1917; p. 72) that he is only once mentioned by Itard—"as a 'case,' not an authority."

point of biology—and the whole problem of the Savage of Aveyron was a biological problem—we can now see what was Itard's fundamental error in his earlier educational scheme. Of the biological trinity—organism, environment, function—he took the organism for granted, assumed that its *endowment* in regard to potentiality, adaptability and tendency was not deficient, and that it could therefore play its part in that dynamic inter-relationship with the environment which is termed function. Thus his chief concern was for the careful selection and use of environmental means and influences. When, however, he realised the idiocy of his unfortunate pupil and arranged accordingly his new scheme of education, he gave serious attention to both organism and function.

At the time he began his educational work he believed with Pinel and other leading medical authorities that an idiot could not be cured or educated, and had he thought then that his savage was an idiot he would not have undertaken his great task. Fortunately, however, for Dr. Montessori and for educational thinkers in general the discovery of the boy's idiocy did not come about until his educability had been demonstrated to the satisfaction of his teacher, who was thus encouraged to continue his labours.

His clear realization of the needs of the case as he now correctly diagnosed it is shown by the fact

that he definitely based his further work on the training and development of the senses. "To the works of Locke and Condillac," he wrote, "we owe our appreciation of the powerful influence which the independent and simultaneous action of our senses has upon the formation and development of our ideas. The misuse which has been made of this discovery destroys neither its truth nor its possible practical applications in a system of medical education. It was in accordance with these principles that, when I had accomplished the chief objects which I had proposed for myself at the beginning and which I expounded in my first work, I devoted my attention to exercise and develop separately young Victor's organs of sense."[29]

Itard erroneously believed that the sense of hearing was the most important of all from the point of view of intellectual development, and he began accordingly by endeavouring to stimulate and train that sense. In order to isolate the ear, and especially to remove the numerous constant distractions appealing to the feeble mind through the sense of sight, he bandaged the pupil's eyes. His object was not only to make the boy hear but also to make him *listen*. He began with very loud sounds which differed widely from one another:

[29] Itard's Second Report, 1807: p. 62 in Reprint by Bureaux du Progrès Médical, 1894.

and by using the same means the boy had to produce the sound he heard. First of all he learned to distinguish the sounds of a drum and a clock bell and later others which were progressively less disparate. The teacher hoped that by thus proceeding, on the analogy of his previous successful work, from very wide to very narrow differences it would ultimately become possible for the boy to distinguish between *vocal* sounds. Thus he gradually learned to differentiate and reproduce the strokes of a drumstick on any part of the drum, or on the clock bell or on a sonorous fire shovel. A wind instrument, as being more analogous to the human voice, was next used in the experiments; and at last the voice itself was used. By the same wise method of proceeding from wide to narrow differences Itard at length succeeded in, first of all, enabling the pupil to appreciate even the low tones of his voice, and next to appreciate all the vowel sounds. In these voice exercises the teacher could not insist upon reproduction, but only on attention, *listening*. The pupil was taught to extend a finger when and while he heard; and he so enjoyed these lessons that he would bring the bandage to the doctor as a sign that he wished to resume them.

When the vowel sounds were perceived the next step was to compare them so that they might be distinguished from one another. Extending the

thumb was made to represent A, the index finger O and so on. After great trouble O was first isolated, then A ; but the others remained confused for a long time. And now a serious new difficulty arose. The joy of the pupil rose to wild outbursts, the vowel sounds were confused, all the fingers were often extended at once, and the lessons had to be abandoned temporarily. In the hope of counteracting these outbursts of laughter Itard removed the bandage, but no ear exercises were then possible owing to the distractions thus allowed to operate. Punishment by striking the knuckles was then tried ; but this begat fear and the poor boy's confusion became worse confounded. Itard at last decided to cease his attempts to develop further the sense of hearing, but not before he had enabled Victor to distinguish several monosyllables and to differentiate precisely the intonations of reproach, anger, sadness, contempt, friendship, even when the expression of such emotions was unaccompanied by any change of countenance.

More saddened than discouraged by this small success, Itard turned his attention to the sense of sight, still intent upon the teaching of language. His earlier exercises had enabled the pupil to distinguish the letters of the alphabet, and in a comparatively short time he was able to arrange them to form simple words—the monosyllables mentioned above. A few months after he had learned to form

the word *lait,* and to use it as a means of expressing a want, he was able to read by sight and to write passably a few words, some of which differed but little from one another in form. He could not, however, pronounce these words and did not understand their meaning. His reading was done in the following manner. All the words he knew were written on each of two boards, but in very different order. The teacher held one board and the pupil the other. The former pointed to a word on his own board and the latter found the duplicate in its different position on his and pointed it out. If a mistake were made the words were carefully examined letter by letter until the boy himself was able to make the correction. Very soon he could understand he had erred by interpreting the teacher's disapproving glance and could substitute the correct word quickly and without assistance.

Itard next turned to the education of the sense of touch, the fundamental nature of which, as we have already seen, he failed to realise. Had he begun with the training of this simple and elementary "parent of the senses" instead of with two of its "finer offspring," the highly complex hearing and sight, much greater success would undoubtedly have awarded his efforts. Had he known of Pereira's work, or attended carefully to the teaching of Buffon and Condillac, of which he did know, he could have accomplished much greater things

with and for this poor little pupil. We have shown above (pp. 83 and 84) that the sensibility of the boy's skin had been greatly increased by the use of warm baths and that he had developed a keen appreciation of differences of temperature. The teacher determined to make use of this fact for the first step in the further training of touch. He placed in a vase a number of chestnuts, some hot and some cold. One of the boy's hands was also placed in the vase, the other resting on his knee. In the latter a cold nut was placed, and it was indicated to him that he must produce a similar one from the vase. The exercise was repeated with hot nuts, and his choice from the vase was always correct. The next step was to try to teach him to distinguish *form* and *size* by touch. At first he was quite unable to distinguish between a chestnut and an acorn, and it was clear that careful training was here necessary. Again Itard resorted to his method of proceeding from wide to narrow differences; and when after great trouble and long practice with various objects he at length returned to the chestnut and acorn he found to his great satisfaction that Victor could differentiate them from each other. Further exercise enabled him to distinguish, by touch alone, the letter *B* from *R*, *C* from *G*, *I* from *J*, etc. Beyond this little could be done to improve the touch. The exercises had, however, greatly improved his powers of

attention, and always while he struggled to distinguish form and size by the aid of this sense alone a serious, calm and meditative expression suffused his countenance—a great fact from which Itard should have learned much more than he did. This section of his second Report he summarises thus: "Although far from sharing the opinion of Buffon and Condillac on the important role they assign to this sense, I do not regard as wasted the attention I gave to touch, nor without interest the observations with which its development furnished me."[30]

No further training was required for the boy's sense of smell, which was so extremely acute that when on one occasion he was lost in the streets, and was not found till night had fallen, he was able to recognise his governess when, but not before, he was allowed to smell her hands and arms. As regards taste it was only necessary to 'pervert' it in favour of civilised food and drink. He grew in time to like wine but refused all stronger liquors, while always his favourite drink was water.

Thus very slowly were the senses trained and developed, and with the exception of those devoted to the improvement of hearing, Itard felt that his labours had been repaid. The boy became able to make by touch such distinctions as those between a round and a flat object, by sight to differentiate colours, and by taste to discriminate between sweet

[30] Second Report: reprint 1894, p. 68.

and tart liquids. As things and their qualities were thus taught their names were written, read, and associated with them. The learning of the full meaning of these words, however, formed part of his intellectual development, to the consideration of which we must now turn.

Itard was fully aware of the intimate connexion between the physical and mental elements in man. "Their development," he says, "is simultaneous and their influence reciprocal." But although he clearly realised that all the exercises considered above tended to encourage the development of his pupil's mind he also appreciated the need for more specific mental training. He knew that Victor did not use his little vocabulary to express his needs; that he used the words at such times only as the objects of his desires were brought to his notice—when, for example, food and drink were before him. When his meal time was purposely delayed, or when his cup was taken from him before he had drunk half his milk, he made no effort to express his needs by using his words, even when he was very obviously hungry or thirsty. It was clear that great efforts must be made to teach him the immediate relations between names and things, to establish for him a sort of identity between them. For him the word *lait* might mean milk, his desire for it, or the vessel containing it. Simplicity was to be the guiding principle in these as in former exercises.

A key, a pen, a knife and a box were arranged on cards on which their names were written. Various exercises were then used to establish the relationship between thing and name. At first the boy could not fetch an object unless he could see the name all the time. If made to lose sight of this he would fetch anything available. After long practice, however, he could go to another room to fetch an object. He seemed to realise his own inability to remember name and object and spontaneously *hurried* to fetch the latter. As his powers grew he went more slowly, and at last could stop on his way to look out at a window and yet fetch the thing named. If he did forget *en route* he would return to look again at the name: and always when he brought an object of his own accord compared it with its name. After some months of such practice he became very proficient and rarely made mistakes. But one day Itard decided upon a new experiment. He locked the door of the room from which the objects were always fetched, at the same time arranging similar objects in the room where the lessons took place. Poor Victor hopelessly failed to see that these latter were similar and corresponded to the names used. The teacher was in deep despair. "Unfortunate," he exclaimed, "since my trouble is wasted and your efforts fruitless, betake yourself again to your forests and acquire once more the taste for your

primitive life; or if your new needs render you dependent on society, pay the penalty of being useless and go to die at Bicêtre of misery and sorrow."[31] The pupil, too, was greatly affected, as was shown by his heaving chest, closed eyelids and streaming tears.

Itard's despair was short-lived, however. He saw that the fault was his own in that he had made the boy always associate the names with *objects in a certain room,* and had thus helped to hinder the possible formation of general notions. About this time also he made, without perhaps appreciating its full significance, a most important discovery, namely, the great part played in education by "the factor of use." His pupil should have learned about objects though their use or function. The application of this principle led to more rapid progress. Thus by endeavouring to cut bread with a razor, and finding that instrument ill-suited to the work, he learned to distinguish it from a knife. Indeed, his confusing them was a clear indication of progress. He had not learned the word *razor* and refused to indicate *knife* or any other word as the name of that object. Through education in the use of things he passed to invention or spontaneous adaptation. Thus when he wanted a plate for his lentils and none was available he took from

[31] *Bibliothèque d'Education Spéciale Reprint of Itard's Reports,* etc., p. 80.

the mantel shelf a circular glazed picture frame and used it instead. The doctor had shown him, on one occasion, how to use a pencil case to hold a piece of chalk that was too short. When he next required the case, and it was not there, he *improvised* one by using a rusty cooking utensil. Nor was this last an isolated instance : " il se groupait avec une foule d'autres." And before this growing power of understanding things by their use his merely routine habits and merely automatic performance of tasks gradually disappeared. The number of things and their names also gradually increased and were correctly and definitely associated together. There was at first great difficulty in teaching him to distinguish parts and wholes, as finger, hand, arm. Itard began with a whole that was known—a book. He tore the book into separate leaves, taught leaf and its name in the usual way, and then remade the book. He also adopted the expedient of carefully touching parts while only vaguely indicating wholes. It soon became evident that both the distinction and interrelation between parts and wholes were clearly appreciated.

Attention was next directed to the teaching of qualities and the adjectives denoting them, a beginning being made with size or extension. Two books differing greatly in size were first used. The words *grand* and *petit* were written on cards which

were laid on the corresponding books and left for some time. When they were removed and given to Victor he was able to replace them correctly. Some time afterwards a large and a small nail were examined, and when required he correctly placed them by the two cards. Later similar methods were applied in the case of colour, weight, resistance, and so on.

Verbs were next taught by the simple process of performing certain actions with a familiar object, and writing on a blackboard the name of the object and beside it the verbs concerned : for example *clef* had written beside it *toucher, jeter, ramasser, baiser, replacer,* and other verbs denoting actions the boy had seen performed with the key. Later the nouns and verbs were written on the board and he was required to perform the actions. He gave clear proof of his mental progress when the actions indicated by the given verbs were impossible in connexion with the particular objects named. For when directed to *tear* a stone, he broke it with a hammer, to *cut* a cup, he let it fall ; thus substituting more suitable actions while keeping fairly close to the general meaning of the verbs supplied. But he could also make the action possible by changing the object : when invited to eat a brush he performed the action—on a piece of bread.

During all these grammatical exercises writing was being taught. At first the pupil could not use

a piece of chalk and could not imitate. To teach him to imitate Itard had recourse to his usual method of large-scale operations. The boy was made to imitate arm and leg movements first, then hand, and finally finger movements. He was next placed in the writing position, a long pointed stick was properly placed in his hand, and he had to imitate the teacher's movements. When chalk writing was again tried he carefully imitated, and progress was slow but sure from simple lines to letters. In time he passed far beyond mere imitation, and three grand stages in his advance are noteworthy. At the end of the first stage he could copy all the words he knew; at the end of the second he could write them all from memory; and at the end of the third he could write these words to express his needs and ask for the means of satisfying them. At this period, too, he understood what others wrote within the limits of his vocabulary and would obey written directions.

Notwithstanding all this remarkable progress Itard remained dissatisfied: for Victor could not speak. Having failed to develop sufficiently the sensibility of the ear, the teacher determined to teach speech by training the eye to observe the positions and movements of the vocal organs during the processes of enunciation. For over a year he laboured with this object in view, but notwithstanding his almost incredible patience and perseverance

it was all in vain, and he was most reluctantly compelled to abandon his pupil to his incurable mutism. Had he known and studied Pereira's methods he might have accomplished, in part at least, a task beyond his unaided knowledge and skill.

For the development of the "affective faculties" Itard again relied upon the boy's increasing needs and his growing interest in the uses and properties of things. During the early months of his education the wild boy was like a child in the first days of life, who is unable to show any interest in persons or any appreciation of their care, kindness, or caresses. His first apparent manifestations of affection for Madame Guérin, especially after a period of separation from her, were found to be really due to his associating her presence with the satisfaction of his needs. But as the number and variety of these needs steadily increased so did the number and variety of his connexions and associations with the two persons who always satisfied them. And thus gradually, Madame and Itard became for him definitely distinguished from the environmental complex and intimately associated with all good things. Slowly and steadily the good woman's motherly love and constant care overcame the torpor of his "affective faculties" and he became obviously attached to her. He soon began to give expression to emotions of sorrow, regret, pleasure, delight and joy. He wept over his

failure in his exercises, clapped his hands or uttered strange sharp cries at the success of little personal achievements. Especially would he rejoice in " la réunion de ce qui plait à ce qui est utile," as in laying the table or sawing wood. Pity and sympathy, however, he seemed unable to feel, and Itard thought he always remained selfish. An experiment proved that he had acquired a sense of justice. If unsuccessful in his exercises he never resented imprisonment : but on the occasion of this experiment his work had been good ; and when, nevertheless, the teacher attempted to imprison him in a closet he struggled violently and bit his gaoler's hand. And though injured thus Itard rejoiced in his pupil's progress.

The great hopes with which the doctor had looked forward to the advent of the pubertal crisis were doomed to disappointment. The crisis was very pronounced but it gave rise to no natural or moral expansion. The gentle boy was transformed into a wildly passionate youth who alternated between fits of melancholy and anxiety and mad outbursts of rage in which he bit and scratched Madame and tore off his clothes. His temper became most uncertain and uncontrollable ; and all efforts to reform him proving unsuccessful, the directors of the institution, in their concern for the safety of their little deaf and dumb charges, decided that he must be sent away. Madame Guérin took

him away and tenderly cared for him till his death in 1828. Thus ended one of the most remarkable of recorded educational achievements. And although Itard took no further part in the education of idiots his work had demonstrated their educability and led to great reforms in their care and treatment.

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Through the numerous experiments and expedients employed in the development and instruction of Victor, Itard had acquired greatly increased knowledge and considerable teaching skill, and for these he found another application in devising and carrying out a method of physiological education for deaf-mutes. From his examination of the inmates of the institution he concluded that there were very few absolutely deaf children and that about two-fifths of those under his care could hear the tone of his voice. He believed that in these latter cases the sensibility of the ear could be so improved by his method of physiological education that the power to hear would become the most potent means of acquiring the power to speak. In 1805 he began a series of experiments with six of his young patients, employing means closely akin to those he used in Victor's case. While blindfolded the children had to listen to, and to indicate by signs when they heard, sounds that were gradually decreased in loudness and pitch, and

varying from the tones of a large church bell sounding near them to those of a more or less distant clock bell. When their perception was greatly improved they were exercised in comparing and differentiating tones and in acquiring a sense of the direction of sound. A drum and a flute were also used, and finally he arranged some effective exercises in musical rhythm.

By these means he enabled all these children to hear the human voice clearly, and began the task of teaching them to speak, making use of both sight and hearing. But he had not the special knowledge and wonderful personal skill of Pereira; his pupils were under his instruction for only an hour daily; and they had, moreover, acquired ineradicable habits of expressing themselves by manual signs. By amazing patience and persistence, however, he succeeded in enabling them to pronounce all the elementary sounds of spoken language. Between this stage and that of intelligent speech there was a long and difficult road to travel, and it took him years to achieve a fair measure of success. Three memoirs which he wrote on his system and its results seem to have been lost. But a report[32] upon these documents by the Royal Academy of Medicine is extant, and bears testimony to the value of his methods and of the work he accomplished.

[32] Prepared in 1828. Reprinted by *Bibliothèque d'Education Spéciale*, 1894

It also advocated the use of Itard's methods as a permanent part of the institution's scheme of education, a recommendation which was at once adopted by the administrators of the famous school.

Séguin in his final estimate of Itard's work says : " He was the first to educate an idiot with a philosophical object and by philosophical means. If he did not conceive a philosophical method of education he expressed and realized the first views on this subject, generalising on his savage idiot the sensorial experiments made by Pereire on the touch of deaf mutes ; and specialising on the same forlorn pupil the theories enunciated by Rousseau for the education of mankind. In this double process consists the completeness of his labours ; alternately analyzing and synthesizing, he followed his special aims without deviating from his general object . . . we do not know of anyone who would not gladly exchange all subsequent titles for the authorship of the two pamphlets on the ' Savage of the Aveyron.' Even at present, we quit with regret his few unrivalled pages . . . ."[33] And M. Dacier, Permanent Secretary of the French Academy, in a letter to the Minister of the Interior in 1806, writes : " The memoir of M. Itard contains also the exposition of a series of singular and interesting phenomena and of fine and judicious

[33] *Idiocy*, etc., pp. 22 and 23. *Vide* note on Pereira and Rousseau, *supra*, p. 108.

observations; and presents a combination of instructive processes capable of furnishing science with new data, the knowledge of which must be extremely useful to all persons engaged in the education of youth.''[34]

In his realisation of the great educational rôle of the child's organic needs—those that are mental and moral, social and æsthetic, as well as those that are physical: in his idea of creating new needs and of making them permanent and operative for further development: in his employment of the *factor of use or function* as an educational means: in his encouragement and utilisation of the feeble spontaneity of his pupil, and of pleasure, interest, and imitation: in his method of proceeding from large to small in objects and movements, and from wide to narrow differences: in all these Itard anticipated the principles and practice of twentieth century education. Passages abound in our present-day works on education which emphasise the fundamental importance of his ideas and methods. Thus, for example, Professor Bagley writes: "The synthesis of chaotic elements into meaningful units is made possible by the fact that certain of these elements stand in a definite relation to some *need* of the organism. This need is represented by a pleasant or unpleasant affective colouring . . .

[34] *Bibliothèque d'Education Spéciale Reprint of Itard's Reports*, etc., 1894: pp. 57 and 58.

The factor of *use* is the constant factor in all our experiences with objects and processes of the outer world.''[35] Itard, was, too, though unconsciously, a pioneer of progress towards the present-day biological conception of education: for when the whole of his work is scrutinised with due attention it is seen that he studied his great educational problem from the three standpoints of biology—organism, environment, function.

[35] *The Educative Process*, 1923: p. 73.

EDOUARD SÉGUIN.

CHAPTER III

EDOUARD SEGUIN (1812—80).

HAVING proved through the progress of the Savage of Aveyron that idiocy was not, as the medical world had too readily assumed, the negation of educability, Itard, as we have seen, took no further direct part in the education of its unfortunate victims. Indirectly, however, he conferred upon them benefits very much greater than his personal labours could have brought them by inspiring his brilliant pupil, Edouard Séguin and suggesting to him that he should specialise in the study of their malady and of its amelioration by educative processes. Séguin, the "Apostle of the Idiots" and the greatest of all their teachers, was born on January 20th, 1812, at Clamecy in La Nièvre, one of the central Departments of France. He belonged to a family of good social standing, and of long and honourable association with the medical profession in which many of its members had achieved distinction. He received his early general education at the secondary school of Auxerre in the neighbouring Department of Yonne, and later

proceeded, while still very young, to the Lycée St. Louis in Paris. Having completed his general education he followed the family tradition and began his study of medicine and surgery. He was fortunate in having as his teachers first Itard and later Esquirol, two of the most distinguished French medical men of the time. Both were profoundly interested in the problems of psychology and mental pathology, to the study of which they had devoted many years. To the peculiar problems of idiocy, however, Esquirol, distinguished as an alienist, had not specially directed his attention, and to the end of his life he apparently remained sceptical in regard to the possibility of curing or educating idiots.

At the suggestion of Itard, as we have seen, Séguin undertook the thorough investigation of the nature and causes of idiocy and of scientific methods of remedying it. Mr. Holman writes: "He had the good fortune to be able to observe the work of Itard in his efforts to educate the Savage of Aveyron. He says that Itard was 'an inimitable teacher,' 'my illustrious master,' and 'my guide in the art of educating idiots' and speaks warmly of 'the esteem and admiration which was due to him for the work for which he prepared and inspired me'."[1] Mr. Holman has here fallen into a

[1] *Seguin and His Physiological Method of Education*, 1914: p. 26.

serious error. The statement in the first sentence of our quotation cannot possibly be correct, for Itard had concluded his efforts to educate the Savage of Aveyron some years before Séguin was born. We have not been able to ascertain the year in which Victor was removed from Itard's care; but there is evidence that the great experiment had ended before the writing of his second Report in 1806—very probably in 1805. It began in 1800, and Bousquet, who was intimately acquainted with Itard and his work, spoke of its having lasted "not less than four years."[2] Again, Itard believed that the boy was about twelve years old when he first saw him; and so in 1805 he would have reached the age of seventeen, an age beyond which the advent of the acute pubertal crisis, which terminated the experiment, was not likely to have been delayed. And further, the Savage of Aveyron died on 4th November, 1828, before Séguin was seventeen, and most probably before he had seriously begun his medical studies.

On the completion of his professional course he brought to his special study of idiocy such enthusiasm and ability that early in his twenty-sixth year he had practically established the foundations of his great system of physiological education. He had perceived clearly and had appreciated the significance of the fundamental physiological fact

2 *Eloge d'Itard*, 1839: *Progrès Médical Reprint*, 1894.

that the brain is not an independent organ existing in splendid isolation, but is an essential part of the nervous system. He had also appreciated the significance of the great biological fact that the human being—body and mind and all their constituent parts—is an organic *unity*. Further, he realised that the grand function of education is to complement the ordinary organic development of the child. And as in his opinion the condition called idiocy was very largely the effect of several causes producing retardation of physical and mental development, he believed that it could always be partially and often completely cured by a scientifically conceived and meticulously arranged and applied education of the muscular, sensorial and nervous systems.

In 1837 he began the systematic education of an idiot boy, and the success of his efforts may be judged from the following testimonial written by two of the greatest medical authorities of the time. "We the undersigned have pleasure in testifying that M. Edouard Séguin, born at Clamecy (Nièvre), has begun, with the greatest success, the education of a child almost dumb and apparently an idiot—by reason of the small development of his intellectual and moral faculties. In eighteen months M. Séguin has taught his pupil *to make use of his senses, to take care of himself, to speak, to write, to reckon,* etc. This education has been done by

M. Séguin, after the method of the late Dr. Itard, from whom he has received inspiration. From the character of his mind, and the extent of his knowledge, M. Edouard Séguin is capable of giving to this system of education all desirable extension. Signed: Esquirol and Guersant (Senior). Paris, the 18th of August, 1839."[3] It will be noticed that " the sagacious and careful Esquirol," as Séguin calls him, does not commit himself further than by the admission that the boy was *apparently* an idiot: but such he undoubtedly was.

In 1839 he opened his school for idiots in Paris —the first of its kind. Mr. Holman is again in error when he says that " in this school and in his previous work" he was " from the first advised by Itard,"[4] for the latter died in 1838. The remark is only true in regard to " his previous work." He had, however, the benefit of Esquirol's advice. And previously, it would appear, the latter had personally co-operated with him, for in 1838 was published *Résumé of what we have done during Fourteen Months,* by Esquirol and Séguin. His work in this school was remarkably successful, and soon attracted the attention of French and foreign educationists and philanthropists who visited it in large numbers. His methods were approved by

[3] Mr. Holman: *op. cit.,* pp. 27 and 28.
[4] *Ibid,* p. 28.

all who saw them and in a few years schools for idiots, organised on his plans, were established in England and several continental countries. The Minister of the Interior took official cognisance of his growing reputation, and in 1841 requested him to give a course of lessons to the idiot children in the Hospital for Incurables in order that his methods might be authoritatively tested. Commissioners conducted two careful investigations in 1842 and reported most favourably upon his work and its results. This report so impressed the General Council of Hospitals that arrangements were made for the work to continue, Séguin's next series of lessons being given at the Hospital for the Aged up till 1843.

In 1844 he published a fifty-page pamphlet on *The Theory and Practice of the Education of Idiots,* and in 1843 a more lengthy memoir on *Hygiene and Education of Idiots.* The latter, which was a contribution to the *Annales d'Hygiène Publique et du Médecine Légale,* was considered by a Commission of the Royal Academy of Sciences, consisting of MM. Serres, Flourens, and Pariset, which, having noticed the great obstacles to be encountered in the education of idiots, reported as follows: "M. Séguin has in great part surmounted these extreme difficulties. A varied gymnastics has given to the muscles of his pupils greater and more equal strength. Helped by better exercised senses the

movements they perform have greater accuracy and precision. Further, the idiots have learned to subordinate the action of the organs to that of the mind, of which they themselves would never think. By the methods of teaching which are peculiarly his own, and of which the details would be out of place here, he has initiated his pupils into a knowledge of letters, of reading, of writing, of drawing, and to the first notions of arithmetic and geometry. Through the comparison of the different qualities of bodies he has familiarised them with the abstract ideas of form, colour, density, weight, etc. . . . and with ideas of relation of a higher order, and those which are the highest that the intelligence is able to acquire, *e.g.* ideas of order, authority, obedience, and duty. Also by applying his pupils to labours of body and mind, he has rendered them more robust and more wise. He has caused a happy change in their secret and fatal habits, and probably he will cause them, in time, to forget them, for, having only a certain amount of energy, the more a person is given to work the more it relieves him of bad thoughts. M. Séguin has thus opened up a new career of beneficence. He has given to hygiene, medicine and moral philosophy an *example most worthy to be followed.*"[5]

[5] Published 6th February, 1843. Translated by Mr. Holman, *op. cit.*, pp. 29 and 30.

In 1846 he published his great work entitled *Traitement Moral, Hygiène et Education des Idiots, et des autres enfants arriérés ou retardés dans leur développement, agités de mouvements involuntaires, débiles, muets non-sourds, bègues,* etc. This book, which was crowned by the Academy, firmly established its author's reputation and soon became known and used as the standard text-book in every country in which medical men and others were interested in the important subject of which it treated so brilliantly. He points out in his preface that the doctrines enunciated in the book were based on observations made during ten years of specialised labours. And while fully acknowledging his great indebtedness to Itard and Esquirol, he shows that he really had to find within himself the resources necessary for the formulation and development of his scientific system. He modestly expresses the belief that his work contains entirely new ideas, not alone on idiocy, but on education. But above all does he insist that his system of physiological education is not one intended primarily for idiots and other defective children, but is a system scientifically formulated with a view to supplying all the developmental needs of the normal child. Convinced, as we know, by his earliest investigations that the only hope of raising the idiot towards normality lay in the application of suitable educative means, he turned to the examination of

existing theories, methods and practices, only to find them all defective in that they were not based upon and could not conform to the needs of the organism. They were all incomplete and failed to make due allowance for the psychological and physiological abnormalities to be found in human beings. Thus the conviction was forced upon him that before he could hope for even the partial accomplishment of the great purpose to which he had dedicated his life—the redemption of the idiot from his bondage—it would be necessary for him to institute an original inquiry into the data and first principles of education. And the result of that inquiry was the discovery of his Physiological Method, to the detailed consideration of which we shall proceed when we have concluded our brief account of this great educator's life.

During the ten laborious years he had assiduously devoted to his work before the publication of the book referred to above Séguin had received little or no financial support from the French Government or any other source. Dr. L. P. Brockett of Brooklyn, in the oration he delivered on the occasion of the funeral of Séguin, whom he had intimately known and greatly esteemed, said: "As his experiments were entirely new, he was obliged to support himself and his pupils by the practice of his profession and by literary work. He was, in fact, for many years the art critic of one of the

principal journals in Paris, and at the time he wrote some articles, full of vigour and passion, on political and economic questions." In time, however, his ability won recognition, and Dr. Brockett informs us that "he soon joined a group of the most brilliant literary men in Paris. Among these were included Ledru Rollin, Pierre Leroux, Louis Blanc, Michel Chevalier, Jean Reynaud, and Victor Hugo. Of this circle of brothers, all of whom, some years later, achieved positions of distinction, Edouard Séguin was the youngest but not, despite his modesty, the least brilliant. All had accepted the teaching of Saint-Simon and his successors, Père Enfantin and Olinde Rodrigues, in philosophy and political economy and had a profound conviction in the near approach of a Republic founded on the principle of 'the greatest good of the greatest number.' . . . The greatest part of the payments which he received for literary work, during the period from 1839—1849, were devoted directly or indirectly to his unfortunate and abandoned clients, the idiot children."[6]

Like large numbers of other brilliant young Frenchmen of the third and fourth decades of the nineteenth century, Séguin was profoundly impressed by the religious, political, and social thought of Saint-Simon; and it was from that system of thought that he derived the moral inspira-

6 Quoted by Mr. Holman, *op. cit.*, pp. 35 and 36.

tion for his life's work. It was in his *Nouveau Christianisme,* published in 1825, a few weeks before his death, that Saint-Simon first crudely crystallised out from the amorphous thought of the last quarter-century of his life the complex system of religious and philosophical socialism which was later developed by his disciples—Enfantin, Bazard, Rodrigues and others—into a system of half-mystical, half-practical, political and social ethics. As an ethical system it was normative in nature and imposed upon its sincere adherents the duty of endeavouring to regenerate and elevate humanity and to do good to all mankind, but especially to " the class which is at once the most numerous and the most poor." Its founder had adopted " Love one another" as his grand fundamental principle, and his disciples were impelled to manifest their love for others by engaging in practical schemes of amelioration and true charity ; and so young Séguin, the ardent disciple, heard the call of the evangel and became the "Apostle of the Idiots." In his most important book he writes of " The Christian School (Saint-Simonism), striving for a social application of the principles of the Gospel for the most rapid elevation of the lowest and poorest by all means and institutions ; mostly by free education. The idea of Itard being congenial only to this last school, was nursed in it, in it experienced its natural growth and transformation, becoming from individual,

social; from proportionate to the relief of special cases, commensurate with the wants of many idiots; and from adapted to this class of sufferers, competent to do the training of mankind. It is an undeniable fact that that school, and nobody out of it, has produced among many works of eminence, the only didactic treatises on idiocy, and the last of these closed in the following words: 'If it were possible that in endeavouring to solve the simple question of the education of idiots we had found terms precise enough, that it were only necessary to generalise them to obtain a formula applicable to universal education; then, not only would we in our humble sphere have rendered some little service but we would besides have prepared the elements for a method of physiological education for mankind. Nothing would remain but to write it.'[7] These lines stand, an unheeded appeal to write a work on physiological education. . . . This apparent deadlock in the march of the idea finds its explanation in the fact that the school which developed the idea of physiological training was vanquished.''[8]

It was impossible for one so deeply interested as Séguin was in political and social questions to

7 These are the closing words of his own *Traitement Moral*, etc., published 1846, p. 729.

8 *Idiocy: and its Treatment by the Physiological Method*, 1866: pp. 23 and 24. See footnote on Séguin's English, p. 148.

remain inactive during the stirring revolutionary days of 1848. He became a member of a Commission appointed to prepare and issue a poster manifesto, calling upon the French people to rally to the support of the provisional Government of the new Republic, to declare openly and solemnly their allegiance thereto, and to prepare to defend it against its enemies. Louis Napoleon, who was elected Prince-President of the new Republic, had in the years preceding its establishment engaged in various intrigues and enterprises aiming at the overthrow of the royal régime; and among those who had actively associated with him in these schemes was Edouard Séguin. In 1850, however, the latter learned that Prince Louis, who was doubtless even then considering other schemes that should prepare the way for his enthronement as "Hereditary Emperor of the French," was secretly hostile to the friends and companions of his youth, and persecuted them. Knowing this and believing that there was little hope of enjoying future freedom of thought and action in France, he emigrated with his wife and young son to the United States where during previous visits he had made many friends and where his book and his work were well known.

Already a beginning had been made in the States in the establishing of schools for idiots and other mentally deficient children, the founding of

these institutions being due to the influence of Séguin and his work. "As early as 1842—3," he writes, " Horace Mann and George Sumner had become familiar with our personal labours at Bicêtre, on which they wrote approvingly, sending over the seeds which soon rose from American soil."[9] And now while living on that soil he was able by his personal labours and influence to effect the extension and improvement of the good work so dear to his heart. He visited the various institutions, consulted with the medical directors and staff, advised, instructed and inspired the teachers, and for a time acted himself as Director of the Pennsylvania School for Idiots. His work was often interrupted by visits to Europe which were necessitated by the ill-health of his wife who suffered from an incurable disease. He twice visited England—in 1873 and 1877—and met Drs. Shuttleworth and Langdon Down, of whose work among mentally deficient children he spoke in terms of generous praise. He inspected many of the schools for defectives in this country and wrote very acute and generally unfavourable criticisms of their work. He especially condemned the training *for show* of certain carefully selected children. The following critical passage deserves the careful consideration of all educators: " In England teachers do not seem to attach sufficient import-

[9] *Idiocy*, etc., p. 12.

ance to that period of the education which corresponds, with the idiot, to that which I will call the *building mania* in the infancy of peoples. If we can make the pupils enter upon this period, and if we arouse that taste in them, they may, through it, be carried to the conception of higher combinations of parts to form a whole, besides acquiring—through the various attitudes, operations, and manipulations of the material—the physical aptitudes comprehended in the word *dexterity*. They (the teachers) do not seem to understand that bodily evolution—and, therefore, rational evolution—which gives precedence to the systematic movements of the body—at first concentrated in the hand—over drawing, of drawing over writing, and of writing over reading ; that is to say, an order which is almost the reverse to what actually obtains, unless, as in the majority of instances, there is no order at all, either practised or suspected.''[10]

During his long exile he maintained a correspondence with the directors of European institutions for the training of idiots. He became widely known and greatly honoured throughout Europe and America, and was elected to membership of many learned societies. He took a keen interest in the transactions of these bodies and often enriched them by his own contributions, which,

[10] Quoted by Mr. Holman, *op. cit.*, p. 42.

whenever possible, he submitted in person. One of the most interesting and important of these contributions was the paper he read before the British Association at Cork on " The Psycho-Physiological Education of an Idiot Hand." The news of his death in October, 1880, was received with sincere regret by thousands of European and American scholars and pioneers of educational and general social reform.

It was in America in 1866 that he published in English his most important work—*Idiocy: and Its Treatment by the Physiological Method.* Though the fact is not suggested by the title, this is really a great work on the theory and methods of education, containing his brilliant examination and exposition of its data and fundamental principles and his illuminating suggestions in regard to its practice. Together with much fresh material the book contains practically all that was essentially educational in his earlier works, and thus supplies to the student of education a complete account of the author's views and methods.

Séguin, as we have seen, appreciated the significance of the one great fact, so often ignored by many educators to-day, that the pupil is an organism, an entity in which body and mind—reflexes, instincts, senses, muscles, nerves, intellect, feeling, will—are *unified.* The child is predominantly an animal though always a man in

essence; and in order that he may be developed by education into the highest type of man he must be first the best possible animal. By this he means that all the physical and functional powers of the child's muscular, sensorial, and nervous systems must be developed to their highest efficiency, for only by such efficiency can the greatest possible educational development of the mind be achieved. The brain, the organ of mind, is a part of the nervous system, and through this system alone can the mind of the pupil be reached. And in its turn the nervous system can be reached only through the muscles and senses; so that the education of the child must begin with the training and development of his muscular and sensorial powers. In this we find Séguin in accord with the best twentieth century thought. Thus Professor Horne writes: "All appeals to the mind, educational and otherwise, must be made through the agency of the nervous system. The senses on the one hand and the muscles on the other are the two first gateways through which educational influence must proceed. The educator who would climb up into the mind by some other way is unaware of the nature of the child with whom he has to deal. The training of the senses and the doing of things well that require delicacy of muscular adjustment are the two beginnings of physical education, and only a sound physical education can support a sound

mental education."[11] We shall let Séguin himself state his general principles in the following notable passages :

" According to this method education is the *ensemble* of the means of developing harmoniously and effectively the moral, intellectual, and physical capacities, as functions, in man and mankind. To be physiological, education must at first follow the great natural law of action and repose which is life itself. To adapt this law to the whole training, each function in its turn is called to activity and to rest ; the activity of one favouring the repose of the other ; the improvement of one reacting on the improvement of all others : contrast being not only an instrument of relaxation but of comprehension also.

But before entering farther into the generalities of the training the individuality of the children is to be secured : for respect of individuality is the first test of the fitness of a teacher. At first sight all children look much alike ; at the second their countless differences appear like insurmountable obstacles ; but better viewed, these differences resolve themselves into groups easily understood, and not unmanageable. We find congenital or acquired anomalies of function which need to be suppressed, or to be given a better employment ; deficiencies to be supplied ; feebleness to be

11 *The Philosophy of Education,* 1909 : pp. 61 and 62.

strengthened; peculiarities to be watched; eccentricities to be guarded against; propensities needing a genial object; mental aptness, or organic fitness requiring specific openings. This much, at least, and more if possible, will secure the sanctity of true originality against the violent sameness of that most considerable part of education, the general training.

The general training embraces the muscular, imitative, nervous, and reflexive functions, susceptible of being called into play at any moment. All that pertains to movement, as locomotion and special motions; prehension, manipulation, and palpation, by dint of strength or exquisite delicacy; imitation and communication from mind to mind, through languages, signs, and symbols; all that is to be treated thoroughly. Then, from imitation is derived drawing; from drawing, writing; from writing, reading; which implies the most extended use of the voice in speaking, music, &c. The senses are trained not only each one to be perfect in itself; but . . . so that if the use of any one be lost, another may feel and perceive for it. . . . But, instead of this, the present use of our senses is nearly empirical. . . . Let our natural senses be developed as far as possible and we are not near the limits of their capacity. Then the instruments of artificial senses are to be brought in requisition; the handling of the compass, the

prism, the most philosophical of them, the microscope, and others must be made familiar to all children who shall learn how to see nature through itself, instead of through twenty-six letters of the alphabet; and shall cease to learn by rote, by trust, by faith instead of by knowing."[12]

"This method, object of the present exposition, consists in the adaptation of the principles of physiology through physiological means and instruments, to the development of the dynamic, perceptive, reflective and spontaneous functions of youth."[13]

"Our method, to be really physiological, must adapt itself in principles as well as in its means and instruments, to the healthy development and usage of the functions, particularly of those of the life of relation: the apposition to be true must leave no gap, suffer no discrepancy. Man being a unit is artificially analysed for study's sake, into his three prominent vital expressions, activity, intelligence and will. We consider the idiot as a man infirm in the expressions of his trinity; and we understand the method of training idiots or mankind as the philosophical agency by which the unity of manhood can be reached as far as practicable in our day, through the trinary analysis.

12 *Idiocy,* etc., 1866. Columbia University reprint, 1907: pp. 26 and 27. Séguin's English, acquired late in life, is not always idiomatic; at times it is quaint through his use of gallicisms.

13 *Idiocy,* etc., p. 257.

According to this trinitarian hypothesis, we shall have to educate the activity, the intelligence, the will, three functions of the unit man, not three entities antagonistic one to the other. We shall have to educate them, not with a serial object in view (favourite theory of A. Comte), but with a sense of their unity in the one being. Activity, besides its unconscious and organic functions, divides into contractability and sensibility, with their specific tendencies; Intelligence branches into many sub-functions, and Will into its protean expressions, from love to hatred.

The predominence of any of these functions constitutes a disease; their perversion leads to insanity; their notable deficiency at birth constitutes idiocy, afterwards imbecility, later dementia.

Physiological education, including hygienic and moral training, restores the harmony of these functions in the young, as far as practicable, separating them abstractedly, to restore them practically in their unity.

This is the psycho-physiological principle of the method.''[14]

'' These alternate reactions of the perceptions on spontaneity, of the will on reflective agencies, is the *modus operandi* of the physiological process of education for idiots, for children, for mankind. They take place in the terminal loops or plexuses

[14] *Idiocy*, etc., pp. 58 and 59.

which are scattered in the integuments like so many peripheric brains; in the sensorial and motor ganglia; in the intellectual ganglia or hemispheres. Through the conductors of motion and sensation, the central and generalizing organ receives the external impulse, and transmits its orders to each apparatus of action. This double current forms a functional circle which cannot be interrupted without being destroyed. . . . Whether images are sent from acute senses to an encephalon which cannot register, compare or classify them, or whether centrifugal aspirations cannot be realized by dead or dead-like apparatus of transmission and contact; in both cases, opposite as they are, the result is the same isolation and incapacitation. Now let teaching do, at large for mankind, what infirmity does for idiots and their congeners; let perceptions be sunk in a central organ unprepared to generalise and fecundate them; or let the generalizing agent be sent, through its spontaneous impulses to external organs unprepared for movement or for the correct perception of feelings, and the result will be at least a lowering of human capacity. . . . This cannot be too much insisted upon, that whatever development be given to the sensorial faculties, the reflective and and spontaneous must receive a corresponding culture, and *vice versa.*"[15]

15 *Idiocy*, etc., pp. 63 and 64.

The great permanent problem of education he conceives to be this: "Given an individual or a people—no matter which—how to develop all potentialities in such a manner that the functions acquire their maximum activity, celerity, extension, and precision—cerebral functions, muscular functions; sensorial functions; the organs of thought, of movement, of sensation; functions of body and soul; handwork, intelligence and morality—education should include them all."[16]

Upon the foundation truth that the pupil is an organic unity the pages of Séguin are insistent, emphatic, repetitive; and it is with this theme that some of his finest passages are concerned. And although "for study's sake" we have to examine the unity analytically, and although the exigencies of our educational practice require that we shall direct special attention to this or that constituent part or function, yet we must never forget the harmonious oneness of the "all-souled instrument," our pupil. He himself uses in the first place the trinary analysis into body, mind, soul, variously expressed as physical, mental, moral, as bodily, intellectual, moral, or and chiefly, as activity, intelligence, will. He prefers the first term in this last group because he realises that from the educa-

16 *Traitement Moral, Hygiène et Education des Idiots*, etc., p. 342.

tional point of view no activity can be simply bodily or psychical, but must always be psycho-physiological

The psycho-physiological processes comprised in his conception of activity have to be considered as forming two great correlative groups—the muscular and the sensorial. In other words, activity has two correlative aspects—*motility,* or the organic potentiality of movement, including all those acts, motions, habits, functions, tendencies and adaptabilities which enable the child to give expression to his organic impulses and to establish relations with his surroundings; and *sensibility,* or the power of sense-perception, which is exercised through the sense organs placed at the surface of the body, and upon which is immediately dependent all possibility of inter-relation with the world and, therefore, of educational development. Séguin condemns the ordinary educational theory and practice of his time because in their concentration upon the development of the mind—which they seemed to regard as being more or less isolated—they neglected the training of motility and sensibility, which were thus left to such chance development as followed from their general exercise. And this was a serious error; for even in normal children who may appear perfect in this respect the functions dependent upon muscular movement are never so regular and efficient as they should be; while their

sense functions always require education to render them more regular, more immediately active, and more precise. And so, avoiding this grave basic error, Séguin's Physiological Method requires the educator to begin with the thorough scientific and detailed training and development of the power of muscular movement, to proceed then to the similarly thorough training of the senses, and finally to direct his special attention to intellectual and moral education.

THE EDUCATION OF MOTILITY.

"Let it be one of our first duties to correct the automatic motions, and supply the deficiencies of the muscular apparatus; otherwise how could we expect to ripen a crop of intellectual faculties on a field obstructed by disordered functions."[17] And in doing so we must ever consider the individuality of the pupil, his peculiar endowment and special needs. Nowhere is the observance of this principle more necessary than in the very first stage of our educational efforts. "Training and education begin where previous functions and acquirements ceased. The beginning of the treatment of each child is where his natural progress stood still; so many children, so many beginnings. For every function or capacity the start varies as much."[18]

17 *Idiocy*, etc., p. 66.
18 *Ibid*, p. 68.

But although in the case of idiots the individual abnormalities and defects are numerous and varied, we can nevertheless classify them, from the point of view of motility, into certain large groups. First of all there is the group, happily exceedingly small, in which there is complete loss of the power of voluntary movements, including locomotion: in such cases the only movements are the involuntary contractions of organic life. The trouble here should not hastily be attributed to paralysis, but rather to desuetude of motivity. Secondly, there are the cases of relative immovability, partial loss of the power of movement, "the result of inertia." This is shown by the child remaining on the spot and in the attitude he is placed, or by the impossibility of his hands taking hold of anything, or even taking food to his mouth. This relative immovability is "the first expression we meet with of the radical elements of idiocy, the negative will . . . made nearly indomitable by the silent protean, 'I will not' of the negative will."[19] There is a third large group of cases of anomalous movements—automatic, mechanical, or spasmodic—which are mostly seated in the wrist and fingers, and which may or may not be accompanied by the negative will in regard to the larger movements. Until these anomalous movements are overcome no progress is possible in the education of motility. And in this

[19] *Idiocy*, etc., p. 71.

connexion Séguin enunciates two important principles: first, that the negative immobility—due to the "negative will," the "silent protean 'I will not'"—must be transformed by education into the positively willed immobility which is the true starting-point for all deliberate, conscious activity; and second, that in endeavouring to overcome by education the various abnormalities of movement we must not "look at the inefficiency of a single part, but consider the incapacity of the whole motor function."

At first, then, the grand object is to secure this complete willed immobility: the child is to be taught to lie, sit, stand, of his own free will. When achieved this immobility is to precede and succeed every exercise. Attention can next be directed to the large movements of walking. If the pupil is so passive and inert that he makes no effort to move, the teacher must employ means to act on his limbs almost in the way that spontaneous impulses would act. Thus the legs may be made to bend by the use of a "baby-jumper." If the feet do not move forward as in walking they are made to encounter a springboard, which insists on simulated walking movements as "an intelligent, indefatigable ground would do." Kneading the muscles, handling the joints, moving with the floor of a tread-mill, and such devices are also employed, and the use of each is followed by rest. But after all this the pupil

may not walk or even stand erect; and another ingenious expedient is employed. The pupil is raised on two blocks or steps as narrow as his feet, and he is even allowed to fall, though injury is carefully prevented. Soon he will strain and use his muscles to save himself from falling, and thus he *stands* and his strength is gathered. But "he is anxious, he does not know exactly why, nor what to do, nor what not to do." Then other blocks are placed in front of him, and when helped a little with the hand, or even a finger, he tries to escape from his great uncertainty by stepping from one to another, still anxious and crying—but *walking*. But when he can walk he does so with a curious swinging of the body which is due to the incapacity of his arms and hands as instruments of equilibrium. These are gradually trained in a manner described later, and the pupil has acquired walk and equilibrium. There remains, however, another serious obstacle in the peculiar lateral swinging characteristic of the idiot, his "betraying incapacity." Improvement both in the leg action and in the equilibrium are necessary to counteract this defect; and for this two kinds of exercises are arranged, the first to deal with legs and arms, and the second to harmonise the complete functions. The apparatus for the first kind will include for the legs various grades of stairs, and a ladder fixed horizontally so that the pupil can walk between the

rungs ; and for the arms dumb-bells, Swedish clubs, and various means for producing arm extensions and balancing. The apparatus and the mode of using it for the other kind of exercise are best described in Séguin's own quaint way : "The second is composed of the aggregation on a small space, like a room or a piece of shaded turf, of all the planes, horizontal, inclined in the four directions, abruptly cut, rough, stony, slippery, narrow, etc., which could present themselves as ordinary impediments to regular progression. The child must go through these difficulties with or without dumb-bells, steadily commanded, or urged by the excitement of music."[20] Again footprints or forms are arranged on a floor at irregular intervals, pointing in different directions, and taking unexpected turnings : and along these the pupil has to tread his course, placing his feet exactly on the forms. " The act of directing each foot on each form is one of the best exercises for limbs which have previously escaped all control ; but what a superior exercise it is for the head above, which has never suspected its regulating power : to walk among so many difficulties is to think."[21] Many similar exercises are practised, all presenting both physical and intellectual problems to the child. When by his individual efforts he has become proficient in

[20] *Idiocy,* etc., pp. 75 and 76.
[21] *Ibid,* p. 76.

them he is allowed to repeat them in the emulating company of others. Here aided by music and by example all forget fear, dry their tears, enjoy their tumbles, and perform "charming little braveries." And we must note—"These children could not move of late, and to-day they are in their first well-earned perspiration; do not let them catch cold, particularly in the moral sense."[22] There remains to induce him to exercise his new powers *spontaneously*, but this means the rise and development of the "synergic will," the source of all voluntary activity and is a question of moral training to be discussed later.

Séguin proceeds next to give an account of his purposes and methods in the education of the idiot's hand. But although in the course of his ordered exposition of his principles and practice this account follows that of the training in standing, walking, balancing and general bodily control, we are not to assume that this training was completed, or nearly so, before the education of the hand began. The latter was, in fact, begun quite early. Dr. Wm. Boyd in his interesting chapter on Séguin says: "After steadiness of foot has been acquired and the body has at last got a firm base, it is time for the training of the hand to begin."[23] But Séguin himself says, when writing of the manual incapacity

[22] *Ibid.*

[23] *From Locke to Montessori*, 1917; pp. 101 and 102.

of the idiot: "Considering the gravity of this infirmity, as shutting the being out from any intercourse and creating the most positive isolation, the task of teaching prehension can never be commenced too soon. Even the impossibility of standing on the feet must not be a cause to delay the improvement of the hands, since we see babies seize with their contracted fingers before they can use their feet to stand."[24] He attached the greatest importance to the scientific education of the hand; for its efficient functioning leads to the highest physical, intellectual, and moral development, while "its incapacity puts a barrier between the idiot and everything to be acquired." "The hand is the best servant of man; the best instrument of work; the best translator of thoughts; the most skilful hand is yet, in respect to certain realizations, as it were idiotic; our own hand shrivels before we suspect the thousands of ideas which it might realize. . . . It alters the surrounding bodies into likenesses of some ideal, which must preëxist in the mind; it consequently transmutes what is a mode of thinking into a mode of being."[25] The developed hand has two great powers which are not always distinguished—the power of prehending and that of handling. Prehension is the complex action of seizing, holding, and letting go:

[24] *Idiocy*, etc., p. 78.
[25] *Ibid*, p. 82.

it is mainly a physical power and is applied to all kinds of objects in very much the same manner. Handling, however, is more subtile and intellectual: it is always a *willed* action, having reference to things, persons, feelings and so on. Everything is handled in a manner peculiarly suited to its nature: thus a glass, an axe, a pen, a spade, are very differently handled. A third power of the hand is the "aggressive power" over substances to be worked. "The hand displaces and combines objects by prehension: it acts on the surface as in polishing, drying, etc., by handling; it acts on the substances proper, as in carving, cutting, hammering, piercing, by aggression."[26]

The first great object is the development of the power of prehension. If the idiot is unable or unwilling to use his hands he is placed in front of an inclined ladder; his feet are arranged on a round and his hands on another. If he does not grasp he cannot maintain his position, and the teacher, who holds him by the ring of his gymnastic belt, regulates the fall. He is replaced and allowed to fall or slip several times until for his own comfort he grasps the round. But if, through persistent negative immobility, he fails to grasp after a number of attempts sufficient to make him acquainted with the various parts of the apparatus, he is transferred to a perpendicular ladder and placed upon it as

[26] *Ibid*, p. 82.

before. The teacher, standing on the opposite side of the ladder, with his hands placed over those of the pupil, exercises sufficient pressure upon them to prevent a fall, thus making the child assist to some extent in supporting his own weight. If there is still no prehension he is next placed on the rounds of the inclined ladder, but this time on the inner side and higher up. Standing on the opposite side, the teacher assists the grasp as before, and then slowly pushes the child's feet off their round. This gives rise to a contest, in itself educative, the child endeavouring to regain his foothold, the teacher preventing him. But before this struggle can result in exhaustion the teacher removes one of his own hands, when the pupil. of course, removes his, which then moves aimlessly about, "not knowing what to do with itself." The object is to guide this hand to the next round below. This the child usually grasps *spontaneously* because it offers a sort of repose and security, and is less vigorous than the imposed grasp of his other hand above. If he does not grasp he is assisted as before. The process is repeated with the other hand, and thus teacher and pupil slowly descend the ladder. By this and similar exercises prehension is gradually induced. But it is a *frightened grasp,* taken *instinctively,* for repose or to prevent a fall. The new power must be instantly used for less instinctive purposes, the aid of pleasure being

called in. In regard to this newly acquired power the child must be given impressions of "attribute and usage" : the function must be intellectualized. " For this practical consideration, as soon as a function begins to be accomplished mechanically we set it in action for purposes and objects more and more intellectual, trying to leave no gap in the series of progress till the function is thoroughly elevated to the rank of a capacity."[27] So when the child has concluded his ladder exercise he is not left to look dolefully at his smarting hands. They are extended horizontally and such a pleasantly cool object as an apple or a large crystal ball is placed in each : and partly to prevent them falling, and partly to retain their grateful coolness on the burning surfaces, the fingers are spontaneously contracted, and circular, equal, and *willed* prehension takes place. Thus while force gave the first consciousness of the prehending power, pleasure confirms it, and the organ is ready for unexpected perceptions ; the hand is, so to speak, being prepared " to think and to foresee for itself."

Care must be taken not to continue too long the strenuous ladder exercises above described as they are apt to have detrimental effects upon the undeveloped physique. Shoulders may be raised or rounded, joints stiffened, and hands made unfit for

[27] *Idiocy*, etc., p. 79.

light and quick work. To prevent such results the ladder exercises are alternated with those devised for the balancing pole. The stiffness caused by the former can also be counteracted by several brisk exercises which are described later in connexion with training in imitation. Attention must always be given to the three modes of prehension—seizing, keeping hold, and letting go. Thus *for years* is the hand trained, but not always by means of special apparatus; the common things of daily life have even greater educational value when the hand can use them. Gradually the power of merely formal prehension is developed into that of easy and intelligent *handling*, with its immense range of capacity: and the second main object of the education of the hand is achieved.

The hand is now ready for the training and development of its "aggressive power," its power to work. Here again immense obstacles have to be surmounted; for the hand is still clumsy and weak, and its poor owner does not yet possess the power of making the co-ordinated movements necessary for the accomplishment of even a simple definite task. The mind presents to the hand no problem that demands solution: there is no will to persist in such efforts as are begun under the influence of the teacher's will: and even when, later on, the child can will to work there remains the difficulty that his synergy is easily exhausted.

A beginning is made with the simplest and lightest tasks, and great use is made of imitation and repetition. "The girl who begins to wipe the dishes, the boy who picks up the stones in the field, are above all helping to save themselves from the horrors of idiocy." Gradually the use of tools and implements is introduced, slowly the aggressive or working power is developed, and at last the third object of hand training, which is the main object of all the training in motility, is thus achieved. Its higher objects, concerned with intellectual and moral development, have been in slow process of realisation throughout the exercises.

Séguin's special apparatus and devices, both remedial and educative, are worthy of the most careful study. Serious physical malformations and infirmities which would greatly retard, or even prevent, educational progress, had to be remedied. One very ingenious and effective instrument of amelioration is the back-board, the equaliser. This is a board ten inches wide and long enough to be inclined ladder-wise against a wall. It is fitted with rounds ten inches apart which project from either side : "it looks like a centipede." The child lies with his back to the inclined board, reaches his hands up and grasps a pair of rounds, places his feet on the lowest pair, and then by using feet, legs, arms and hands draws himself up to the top, where he is allowed a rest. This pause serves

several purposes : it allows repose, the calming of emotions, and opportunity to appreciate the novel exercise, the distance from the floor, and the appearances of things as seen from above. Before the descent in measured mode is commenced the defective body is most carefully composed as nearly as possible in conformity with physiological normality, and every part that can share in the distribution of pressure and tension is arranged so that it can best do so. By the judicious use of this apparatus differences in shoulder formation and length of limbs, spinal deviation and other serious deformities gradually disappear.

Another valuable contrivance is a swing made to act against a springboard, the latter allowing of adjustment to suit children of varying sizes. By a rope and pulley arrangement the child can supply his own motive power either by command or spontaneously. In contrast to the ordinary swing which lulls the child and depresses his nervous system, this swing impels to activity, to healthy and controlling contractions, strengthens arms, neck, spine and legs, and destroys abnormal sensibility in foot or hand. Above all it encourages and affords opportunities for the exercise of spontaneity.

Séguin found dumb-bells of great service in many of his exercises. He used them physiologically to regulate equilibrium when trying to

secure positive immobility, and when carrying out his exercises in standing, walking, jumping, going up and down stairs, and so on; to develop the shorter or weaker arm or side; to reduce irregular to regular movements, and abnormal to normal gestures. They were also of great value in teaching prehension, appreciation of weight, and obedience to commands; while by requiring the alternation of muscular contraction and relaxation their use helped to develop notions of time and reality. To Séguin it was very obvious that his dumb-bell exercises, which were never employed merely to give momentum to automatic balancing, were important aids to intellectual as well as to physical development. Both iron and wooden bells were used, and care was taken to avoid stiffening the feeble fingers through too prolonged use of these instruments. Swedish clubs were also used both for the sake of variety and because of their more showy appearance: and "*abondance de bien ne nuit pas.*"

Another most valuable piece of apparatus was the balancing-pole, a round stick of hickory from three-and-a-half to four feet long, made springy by fixing a wooden ball at each end. It was thrown backward and forward between teacher and pupil from gradually greater distances and with progressively increasing force and rapidity. The majority of the idiot pupils offered almost insuper-

able resistance when this exercise was first entered upon. But Séguin insisted, and to prevent the child's running away he was mounted on steps near a wall. An assistant stood behind him to arrange his hands for receiving and throwing the pole, the help given being gradually lessened until the child was able to do both himself. The careful scientific use of this apparatus slowly but surely developed the power of co-ordinated movement, strengthened muscles, blunted hyper-sensitiveness of palm and fingers, and helped to train touch and sight.

For the training of hands and fingers for smaller and more delicate movement and manipulation Séguin arranged numerous devices and expedients. "It seems," he says, "that the smaller the organ, the more complex are its functions; at least the many ways of using the extremities of the hands, which are so complex in prehending, handling, modifying everything, justify this remark, and explain why more time, more care, more instruments, more ingenuities have to be spent during many years, with the sole object of giving skill to the fingers."[28] He found the use of bricks very effective for strengthening the phalanges and improving the power of grasping. Blocks shaped like dominoes and of definite dimensions were used for superposing and combining in many ways, and helped to develop firmness and precision of

[28] *Idiocy*, etc., p. 87.

handling. The same purpose was served by his nail-board which was pierced with holes into which the child fixed nails, afterwards removing them and repeating the exercise. Other ingenious exercises whose great educative value is very obvious were arranged to provide for the adjustment of geometrical figures to slots of the same dimensions; the collection with the fingers from a smooth table of articles requiring delicate manipulation, such as beads, pins, coins, wafers, small patterns and pieces of thin pasteboard; the winding up of cords of varying thickness and the pulling of ropes; pressure on some mechanism that could produce pleasant sounds or sights; buttoning and unbuttoning, lacing and unlacing, threading beads, and numerous other occupations. All these were "truly physiological in their perfect adaptation to some deficient function of the hand," and were intended to prepare the fingers for dealing with all shapes and with all kinds of aggressive activity. "But, after all, the best gymnastics of the hands are drawn from the things held, handled, modified in the daily habits of common life; we said it at the beginning, we repeat it at our conclusion": and greater favourites than the above apparatus were the spade, the wheelbarrow, the watering-pot, the bow, the wooden horse, the hammer and the ball. All of them, however, whether specially devised by an ingenious mind or chosen from the things in

common use among men and children, are only some of the means to the great end. Of infinitely greater importance are the scientific principles that determine their 'selection' and 'application': "But in such matters," says Séguin, "the means and instruments are more easily remembered than the philosophy of their application; whilst that philosophy is the very thing which is above all not to be forgotten."[29]

So far in the education of motility the child has remained either passive—while teacher or apparatus compelled him to move; or semi-active—responding to the persistent pressure of person or device, and doing only what he must do. From this stage to that of spontaneous activity is a good step and can only be taken by the help of an agency contrived by nature, an agency which is "neither entirely passive nor entirely active; its initiation is passive, its performance is active; its modes are prescribed, its execution voluntary; and its performance admits of protracted reflex spontaneity—we have described the power of imitation . . . . . the power, resulting from reflex spontaneity, of repeating after others acts that we should not or could not have done of ourselves."[30] Fortunately idiots can be induced to exercise this power which can provide motives for innumerable activities. Imitation,

[29] *Idiocy*, etc., p. 88.
[30] *Ibid*, pp. 88 and 89.

according to Séguin, is of two kinds—personal and objective; the former when it affects the person only, as in moving an arm or a leg; the latter when it more particularly affects an external object, as in placing a book in a given position. By the judicious use of personal imitation, never too early begun or too much practised or extended too far in its physiological applications, rapidity and precision of bodily movement are acquired just as gymnastics give stamina and strength. A beginning is made with the largest movements, those involving the whole body, as sitting, standing, kneeling. Movements involving the larger limbs or bodily parts follow, head, arm and leg motions being imitated. Later still the child has to imitate movements of fingers, lips, tongue and eyelids. The total and partial, the large and small movements are gradually interrelated into organic motility, and the whole being learns to respond to numerous and varied stimuli. Care must be taken to avoid mere automatism: the pupil must be trained to give ready response to any sudden and unexpected call for activity. In this way mental development is furthered, a fact which is soon shown by the permanent look of intelligence which illumines the countenance.

In order that personal imitation may be initiated there must be a concentrated operation of attention between the teacher and the individual child. The

two should be isolated in silence and there should be a prevailing monotony in regard to light, colour, and general attendant circumstances. But when some imitative facility has been acquired the room of silence is forsaken and future lessons are given in a larger and brighter room under the contagious influence of group imitation. For training in objective imitation the *rationale* is the same as that discussed above. In this case there is an almost unlimited variety of activities from which to choose for exercises in the correct and immediate reproduction of movements affecting the relations or sensible properties of objects. In the group work the pupils who have reached the same educational stage are carefully arranged so that the special aim of each lesson may be most easily achieved: sometimes open drill formation serves best, sometimes a single straight row or a crescent arrangement. If new movements are to be taught, all the pupils must have a clear view of the teacher: but if the chief aim of the lesson is to render more accurate and ready the performance of some familiar motions they must be allowed the advantage of a double stimulus by observing the teacher and one another, the more expert among them being placed in conspicuous positions.

Séguin gives the following specimen group lesson to illustrate more clearly his method of developing motility. The group consisted of a

dozen children: "The first attitude is upright immobility: without saying a word, we dictate with gestures the following attitudes: feet closed, feet open; forward the left foot, feet again closed. Raise the right knee, raise the left; a firm slap of the right hand upon it, and motionless. Some manœuvres of the left limbs; then eyes shut, and open. The two indices crossing each other; forward the right foot; arms crossed; down on the knees, up again with extended hands, first attitude —rest in immobility. Next we dictate more special positions. Face right, face left, hands raised, one foot forward, left hand out, both hands out, close the fists, open them, shut them again, extend indices, abut them, shut them. Down with the right thumb, up with the left, both flat on the closed hands. Little fingers extended, indices also, abut the four, shut them all. All the fingers apart, all close together, indices apart from the other fingers, little ones the same; all open, all shut. Majors of both hands crossed at right angles, all the fingers of both hands *en chevaux-de-frise,* all shut in that attitude, separate them briskly. And many more combinations easier to find than to describe, closing by three cheers and three claps of the hands, for the pupils are now warmed, bright, tired, but not exhausted; final immobility."[31] These and many similar exercises,

[31] *Idiocy,* etc., p. 91.

performed entirely through imitation, render movements more facile and accurate, improve the functioning of sight and of all parts of the body, extend the range of the perceptions, develop the understanding, place the body and all its parts in subordination to the will, and, most important of all, educate the dead hand to do living work. The rapid and continuous account of the above typical lesson, which seems to suggest the considerable advancement of the idiot children, must not make us forget the long, difficult, often disheartening work with individuals before this group stage was reached. And after reaching it the teacher had to return again and again to the individual work. But his reward comes when after months of patient effort he sees with joy his idiot pupils not only imitating successfully such physiological exercises as are described above, but applying their new powers to the habits of life, and trying to eat, dress, stand as he does. Further, they imitate him in his helpful exercises and render assistance to their weaker and more backward fellows. And at last he sees them doing by the influence of habit what normal children do only under compulsion.

THE EDUCATION OF SENSIBILITY.

The development of motility has all along been considerably retarded by defective sensibility. The retardation would have been much more serious

were it not that many of the exercises specially devised for the training of the muscular system were incidentally of great value as means of training touch and sight. When, however, the abnormalities of the muscular system had been rectified, those of the senses, then the greatest obstacles in the way of progress, had to be corrected by exercises specifically designed for that purpose. It will be clear to the reader that although Séguin was emphatically insistent upon the fact that the pupil is an organism which must both by spontaneous and educationally induced activity be inter-related with its environment through functioning, he realised that there is, so to speak, a hierarchy of functions, and that we must begin with the education of those that are most fundamental. He began with those more immediately dependent upon the muscular system in the belief that he was thus preparing the way for the more efficient functioning of the senses. Here again his views are in accord with those of much later thinkers. Thus Professor Irving King writes: "*The differentiation of the special forms of sense experience* from the primary general consciousness takes place as a function of the child's increasing demands for fuller activity. The connections are made possible on the sensory side because they have first occurred, or been made necessary, on the active side. The infant repeatedly finds the same complexes of sensations connected

with a certain set of activities. *The activity is a unit,* and the group of eye, ear, and tactual sensations become inextricably bound up with the act, and perhaps come to be symbolic of it; the reinstatement of one of the sensations serving to call up the image of the others as it sets up the activity for which it stands. The unity in the reference of the sensations comes in on the side of the act. Later, when the object is known as an object, the sensations are easily transferred to it, or, rather, the object seen is recognised as the one touched or seen, because it has been the basis of a previous single activity. . . . If it were not for the connecting activity, there would be absolutely no ground on which the senses could be brought together in their reference and thus become more than mere undefined modifications of the general tonus of consciousness."[32] Séguin reminds us that in the training of all functions, but more particularly those of the senses, we must always recognise the great basic principle, upon which all success is dependent, that "each function of the life of relation is virtually, can and must be made effectively, identical with its faculty; in other words, that each function is psycho-physiological." This principle rules in the case of idiots as in that of normal man and all animals. He complains that in the artificial training of the schools and

[32] *Psychology and Child Development,* pp. 36 and 37.

colleges of his time the education of the senses and that of the intellect were not only unconnected but rendered effectively antagonistic.

Following Pereira, Séguin regarded touch as the one great sense of which all the others were but modifications, and with it he began his training and development of sensibility. Sensations of touch "being concentrated and intellectualized in the hands," it is to the development of the tactile sensibility of the hands that all our efforts must first be directed. At the outset we must ascertain to which of four great causes the defective sensibility of the idiot hand is due. It may be due to some abnormality in the peripheral termini of the nerves, which are the seat of touch, so that the function of the sense is affected at its origin; to defects in the sensorial ganglia which are the seat of the feeling of touch, or perception; to imperfections of the centripetal nerves connecting these two seats; or to deficiency in the cerebral hemispheres with consequent lack of comprehension, will and intellectual synergy. In any particular case more than one of these causes may, of course, be operative: and all our ameliorative and educative exercises must be devised and practised to meet individual needs. The defects due to the fourth cause above, which may affect any or all of the senses, may be left for later consideration.

Sometimes the peripheric termini are over-excitable or morbidly exquisite, and our exercises must be such as will cover them with stronger epithelium. This can best be done by exercises involving much friction, such as carrying bricks, turning coarse-handled cranks, using a spade, and sawing wood. This work will also develop the very desirable suppleness of the phalanges. On the other hand, the nerve termini are dull and insensitive. In this case the objects of contact must not be rough but *substantial* so as to appeal for the full use of contractibility. The hand must be given practice in effecting contact with bodies of various degrees of polish and resistance, such as velvet and a marble slab. Titillating the hand with feathers, "as if it were for fun," is also a valuable practice. The hands should be plunged alternately into cold and warm liquids and into bags filled with eider-down, shells, peas, flour, small shot, and other substances of varying softness and elasticity. And by the help of touch alone, the use of sight being prevented, the child must learn to distinguish the contents of these various bags.

If the centripetal nerves are dilatory in functioning their action can be improved by the use of the light and elastic balancing-pole. This is thrown into the hands of the pupil, who has to throw it back to the teacher, the game being a fast one. The vibrations of the pole send their undulatory

shocks through the hands to the organism just as the bow sends them through the strings to the fiddle: and they must be felt; the centripetal nerves cannot escape their efforts. The result can be judged by the change in the child's activity; for at first he throws back the pole reluctantly, but soon the rapidity and vigour of his return increase. The greater the rapidity and vigour the more efficacious is the exercise.

Should the defects of sensibility of touch remain after reasonably long use of all these exercises, while no integumentary anomaly is noticeable, it may be assumed that the trouble is due to some imperfection of the sensorial ganglia. In such cases the sensibility is more dull than slow, as a rule. The training of the hand should be continued by daily exercise, and recourse should be had to the resources of hygiene and medicine in order that the general constitution may be brought to the most healthy state possible. The sensorial ganglia can not, however, be held accountable for abnormal sensibility if all the sensorial functions fail to transmit their impressions to the cerebral hemispheres. In all such bad cases the hemispheres themselves must be deficient.

Taste and smell may be regarded "almost as appendages to the touch," so nearly are they akin to it. The training of these two senses is of considerable importance, not only on moral and

æsthetic grounds, but also because of its effects upon spontaneity and the intellectual activities. Training in the normal use of food and perfumes produces both immediate and permanent effects on idiots. Evidences of the former are found in their increased sensitiveness to and anxiety to avoid what is dirty and unpleasant, and in their appreciation of and desire for what is clean and pleasant. Thus the training of taste and smell enables the feeble mind to *compare* and *judge* sensorial tastes and distastes at a stage in educational development too early for the general exercise of such mental operations. Gluttony is also counteracted and there is a gradual growth of delicacy in all matters relating to food. In this way the educator obtains permanent effects which always determine the general and frequently the individual future tendencies of his pupils. " Educated in the enjoyment of cleanliness, good food, sweet air, their general tendency is to shrink with horror at the contacts of the streets, chance, and beggarly life which is the lot of many uneducated idiots and imbeciles, and to determine their aspirations towards better and higher walks of life. That special culture opens their laboring avocations in the way of some healthy, honest employment of their small abilities, by which they become gardeners, florists, and farm boys, instead of slaves of competitive labour in

feodal, infectious factories."[33] It is clear that the time and effort devoted to experiments and exercises for the training of these two senses are not wasted. Following Itard, Séguin relied upon wide differences and striking contrasts rather than upon similarities in tastes and smells. Gradually the spontaneity of the pupils became freely operative and they used their hands to convey to mouth or nose things within their reach that were possessed of pleasant tastes or odours.

In his training of the sense of hearing Séguin made free use of the knowledge he had acquired from his close study of Pereira's methods and of the direct personal instruction he had received as a student under Itard. In idiots, as indeed in otherwise normal children, the function of audition is incapacitated by numerous and varied anomalies. Among the causes of total deafness, which is rare, and of partial deafness, which is common in varying degrees, are paralysis, chorea, dyspnœa, unsymmetrical arrangement of the maxillary bones or of the teeth, malformation of larynx, palate and tongue, and, of course, defects in the organs of audition. Such causes must be removed if possible by medical and surgical means before the education of the sense of hearing is begun. Here, however, we are concerned with *intellectual* deafness due to idiocy or other mental defects, and

[33] *Idiocy*, etc., p. 100.

upon this we are to concentrate our attention. The functions of audition, according to Séguin, are hearing, listening, selecting and repelling sounds. The training in the last two which are acquired by experience in special circumstances, and are operative only when the mind is deeply engaged otherwise, really forms part of the intellectual and moral education to be considered later. Simple hearing functions without the aid of attention; auditing when the organ is kept intellectually attentive; and listening when the organ is kept in functional activity by the will because the sounds or their meanings are difficult to understand. For the sake of simplicity of treatment these three may be reduced to two—the passive function of simple hearing and the active function including auditing and listening, the distinction between the latter two, though important, being only incidental. From passive hearing to active audition and intense listening many intermediate stages have to be passed; and many otherwise normal people do not pass them at all. The idiot child must be enabled to reach the highest stage he can, and in general this is high enough for his ordinary intellectual purposes.

The sounds with which we are concerned in the education of this sense are of three kinds—noises, which are connected with *wants;* music, which is associated with the motive powers; and speech,

which is related to the intellect. The sounds of noises are likened by Séguin to the hieroglyphics of phenomena, and they *mean* the thing producing the noises : one noise means pouring water, another means the rushing of winds or the sawing of wood or the frying in the pan which excites the child's appetite. He directs attention to Itard's wild boy who did not hear the report of a pistol held near his head because it could *mean* nothing to him, but heard the fall of a nut because it meant so much to him. An apparently deaf idiot will hear the pouring of water from one vessel to another when he is thirsty, and will turn his head and go for a drink. " What a field to awaken the attention and make the organ ready and sensible ! " Clearly the best methods to employ here are similar to those of Itard and based like them upon development through organic and acquired *needs* and through the *factor of use*. The recognition and differentiation of noises are best taught to individuals in isolation and silence.

Music, however, produces its best effects when employed with groups of children, although for some specific purposes individual attention is required. Even when music has no special meaning for idiots it can yet bring to bear upon them most varied, powerful, and enduring influences which make for their development. Its varied vibrations excite impulses and arouse profound

emotions not previously experienced. It pleases the child without hurting him ; gives rest after hard work ; causes in the immovable child a tremulous stress of all the fibres which is easily convertible into incipiency of activity ; similarly prepares the nervous system ; wonderfully awakens, quickens and supports thought ; dispels anger, weariness, melancholy ; disposes to gentle feelings ; and is above all a great moral sedative. For all these reasons it should play a very large part in the daily life and education of all idiot children. But in order that it may have these most valuable physiological effects, music for idiots must be specially selected or composed with a view to their peculiar wants, tastes, and general circumstances. It should be characterised by striking contrasts, with long pauses following lively measures. The morning tunes should be vivacious to correspond with the pupils' natural dispositions at that time, but should be judiciously modified to suit the bright or dull state of the atmosphere, heat, snow, thunder, rain, or any condition having emotional effects. Later tunes should be such as will lead by a pleasant transition " to the point of slight reflective excitement" required for study. Other tunes will act as a sedative to muscular exertion and allow of concentration of attention. Those used later still will be gay and lively, releasing the mind from the bonds of effort and dispersing the children happily to play-

ground or gymnasium. Lively tunes should precede physical exercises, while those used to accompany the latter should accord with the quick or slow, easy or difficult actions practised. When accompanying voice exercises the notes must sound in prolonged tones to favour the slow and steady enunciation of vowels and syllables. Tunes must also be arranged for artistic and recreative purposes, those for the latter being usually "lively funny airs" of the "popular or coloured kind" which idiots like best, though they are not indifferent to impressive tunes.

"The first teachings of music are not the product of any profound system, but the result of long, steady cultivation of habit." If a pupil does not appear to care for music, or is intellectually deaf to it, he should be placed close to the piano, and at first, if necessary, he should be allowed to rest his hands or even his chest against the instrument. While he is in this position the piano is made to send out its strongest vibrations and then its sweetest tones: next there is a long silence which is followed by further vibrations, and so on. Thus are contrasts used to favour the perception of musical sounds. And all this takes place during group teaching so that there is also present the incitement of other children who are themselves "auditing" and singing. Following this the pupil will receive individual attention in isolation, even in

darkness. The strains of distant music come to him thus without the distracting sounds and movements of other children, and sooner or later the dull ears will hear them. "Surprise sounds, too," are tried occasionally to start up an unexpected sense of hearing."[34] As soon as the pupil shows signs of sensibility to music the various exercises must be made as pleasant as possible so that simple hearing may be developed into the higher capacities of "auditing" and listening. "One, auditing, is developed by giving continuity to the tunes as if they were discoveries; the other, listening, is created by breaking the continuity of the tune at its most interesting accent-point where in language we place the interrogation mark; leaving the ear of the child hearing yet, and listening, as if thirsting for more."[35]

In addition to producing invaluable psycho-physiological, moral, and æsthetic effects music is one of the chief agencies in the teaching of speech; for by its aid the rude, instinctive, animal cries and screams of the idiot—in which, however, we may recognise the rudiments of speech—are modified and transformed into true vowel sounds. Before commencing the more direct and specific teaching of speech the practice of Pereira and Itard should be followed, the pupil being carefully examined with

[34] *Idiocy*, etc., p. 106.
[35] *Ibid.*

a view to discovering any physical or pathological defects and to removing them if possible. The next point of importance, upon which Pereira was especially insistent, is the establishment of good-will, sympathy and understanding between teacher and pupil. Thirdly, all undue interference with the spontaneity of the pupil must be avoided: speech must not be prematurely forced from him. Very probably he will not reveal what he has learned until some time has elapsed. The results of his individual exercises may be expressed during the progress of group exercises, though not in evidence previously in his periods of isolation, and *vice versa*. Often too what fails to find expression during either individual or group exercises will flow spontaneously from his lips "after some lazy looking on, and accidental hearing: we sow and nature fecundates." Imitation is the great means employed to teach speech: and Séguin regarded it as in two orders—musical imitation, already considered, and that which is intended to teach the correct positions and movements of the vocal organs for the pronunciation of vowels and consonants. Imitating the teacher, as is usual in the morning and evening exercises, the pupil applies his hand to his face, moving his fingers around and inside the mouth; while the motions of the face in articulation are correlated with those of hand and fingers. This careful mimicry has a double object: first, to

enable the pupil by touch, sight, and motor activity to make an analytical survey of the various parts involved in speech; and secondly, to enable him to perform himself the necessary movements of the vocal organs. "After this, all the organs of speech, the lips, tongue, etc., are moved freely in all directions and in every manner; and once, as if by chance, in the middle of the mute, mimical exercises, the lips being well closed, we part them by thrusting out an emission of voice which pronounces *Ma* or *Pa*."[36] The same method is used for syllables formed of other vowels and consonants. Difficulties in articulating certain combinations of consonants and vowels are generally overcome by exercises in vocal music, "the irresistible propulsor of the voice." Progress must be made by easy transitions, by small gradations of difficulty, from the emission of simple to that of double or compound syllables. We must always follow nature's own plan, and adapt our teaching to her arrangement and formation of the vocal organs. Between the mechanical articulation of speech and its intelligent use there is a long and difficult road to travel: but in time the patient teacher will have his great reward in the pupil's spontaneous expression of his wants in speech.

Most of the exercises referred to in the foregoing pages have had more or less influence on the

36 *Idiocy*, etc., p. 108.

training of sight; but for no sense is specific and sustained education more necessary than for this. And this education is all the more important because sight and its many and varied abnormalities are more closely related than other senses and their defects to the intellect and its disorders. The first great desideratum is to impart to the eye the power of fixity or concentration: the pupil must be induced to *use* his sight. Here we can rely to some extent upon his needs and upon the factor of use. The things he needs and uses daily are placed in new and more distant positions so that he has to *look* for them instead of finding them by the sense of touch. Many valuable exercises can also be arranged in the silent dark room chiefly used for individual work. Here numerous educative lighting effects can be produced: intermittent rays, geometrical figures outlined in light, silhouettes, small fireworks and large kaleidoscopic displays. The best of all means, however, of fixing the idiot's sight, of penetrating his "glassy or tarnished eye" is the steady, intense, persevering look of the teacher. Alone with the pupil away from all distractions the teacher places him in a position of immobility, and closely facing him gazes intently into his eyes. The child endeavours to avoid the stare, screams, closes his eyes, and throws his body and limbs in all directions. The teacher remains calm and prepared and as soon as the eyes re-open

the steady gaze is repeated. Days, weeks, even months, may elapse before success is achieved: but as soon as the pupil's look is held he has acquired a new power which he uses in taking cognizance of objects and phenomena. At first he uses the other senses to aid his sight, but it gradually gains power by use and at length requires no such aid. If the case is unusually refractory the direct individual exercises must be alternated with "long standings among groups of working children" whose many activities attract the wandering attention of the idiot and at last make him look at them: and this may not take place for years."[37] When it does take place and the sight functions, however feebly, the training in appreciating such properties of bodies as colour, form, combinations of forms, dimensions and distances, is commenced.

Colours are taught in the dark room, which has stained window panes, or elsewhere by means of such things as cards, ribbons, balls, and marbles, which are of similar or contrasting colours and which can be arranged in pairs, so that their similarity and dissimilarity can be constantly observed and tested. Balls that fit into cups of the same hues and other interesting devices for matching colours may be used. As these exercises are designed to teach colour only, great care must be taken to avoid making prominent, and therefore

[37] *Idiocy*, etc., p. 108.

distracting, any other property of the objects used : their shapes, for example, should be very simple. When the power of recognising and differentiating colours has been acquired it should be applied to clothing, flowers, fruits, and other things of daily use and enjoyment, " care being taken to present mostly what is neat to the sight and pleasant to the mind."

The teaching of form is based upon the principle that our appreciation of all shapes has its foundation in our knowledge of a few types to which we refer all others for comparison and contrast. The simplest of these are circles, squares, and triangles, and, while they should be taught as types, the shapes of common objects based upon them should be carefully studied by comparison and contrast, especially the latter. Solid forms must also be distinguished by contrast from those that are painted. By the use of objective imitation in the juxtaposition and superposition of blocks like dominoes various interesting and instructive combinations of forms can be arranged by the pupils. Teacher and child sit at opposite sides of a small table, each having a pile of blocks near his right hand. The former places a block in various positions relative to the table and himself and leads, not directs, the child to do the same. Two, three, four or more blocks are placed in relative positions by both, but only one block at a time is dealt with.

In this way the exercise of simple imitation becomes more and more intellectual, requiring at last considerable powers of attending and combining. Later the teacher arranges combinations of two or more blocks *all at once*, and these the pupil has to imitate *all at once*. Later still the teacher arranges a combination of a few blocks while the pupil watches him. The blocks are then removed and the child is required to imitate the arrangement from memory. It is obvious that in these exercises there is considerable tension, and in order to relieve it each lesson should close with the building, by means of objective imitation, of walls, towers, and other structures *on a large scale*. Groups of children work eagerly at the erection of these fabrics, the sudden collapse of which always causes happy excitement.

Dimensions of bodies are appreciated by measurement which may be made by the eye, by the hand, or by special instruments. As the training of sight is the great object now all measurements are made by the eye. The following is a short account of a typical lesson: "Next to a stick one metre long and divided on each surface into ten decimetres, we put another nine decimetres long and equally marked, another eight, another seven, till the smallest, which is only one decimetre in length. After commencing the comparison with two sticks, the longest and the shortest, we soon mix them all

together on the floor or on a table, we call for them from the smallest up, or from the longest down, and the child must choose them, guided by his sight alone, and range them in order according to their size, verifying only by the touch what he learned by the look.''[38] The idiot pupils became more skilful at this exercise than Séguin himself! Simple preliminary training is also necessary to give notions of distance and to enable the child to appreciate spaces. *Things of the same kind,* books, for example, are placed at different distances apart, and first by objective imitation and later by command, the pupil is required to do the same. For the measurement of distances in a room, from point to point, from person to person or things, the child is placed as it were at the centre of a circle for each set of distances, the nearly equi-distant objects being on the circumference. As soon as differences in the lengths of radii, so to speak, are appreciated in the room, the same method is used in the open air to enable the pupil to judge and compare greater distances.

Of all the properties perceivable by sight those of the plane are the most difficult for idiots to acquire. A knowledge of plane surface is, however, so essential in life and in education that great pains should be taken to impart it to these pupils. Much can be done towards this end by getting them to

[38] *Idiocy,* etc., p. 117.

make level or curved surfaces in sand by using the hand, a spade, a spoon or a roller. The plane for drawing or writing may be studied by objective imitation: the teacher marks with wafers the centre, corners, and other prominent parts of a given surface and gets the child to do likewise on another; or better still, the child's fingers are made to touch the edges, corners, and surface of a given plane such as a slate. When the power of appreciating the various properties of objects of vision and of the plane has been sufficiently developed a beginning can be made with drawing, carving, and the other arts by which the hand "alters the surrounding bodies into likenesses of some ideal" and "transmutes a mode of thinking into a mode of being."

Drawing is begun on a slate. A pencil is correctly placed in the idiot's hand, and taking another the teacher slowly and distinctly draws a well-marked line from the top to the bottom of the slate. This the pupil also does, but "with many peculiarities of weakness and deviation." He has virtually acquired the capacity of drawing a line, but lacks the necessary synergy or correlated nervous power. The effort to draw the line is followed by very obvious fatigue even in the case of robust idiots who can lift heavy weights or work all day in the fields. This lack of correlated nervous energy is not peculiar to idiots. Séguin relates the

case of a very intelligent coloured blacksmith whose first efforts at learning to read were attended by signs of fatigue; "the sweat ran off his face as if he were working over his anvil." The idiot hand must now be submitted to a series of exercises which will correlate its numerous and "delicately blended" muscles and nerves: the weak nervous action must be supported by firmer muscular action in prehension or in grasping than is possible in holding a drawing pencil. Other arts allied to drawing afford opportunities for such exercises. Modelling in soft sealing-wax, clay, putty and other plastic substances, is of great value at first: the pupils mould the typical forms referred to above and imitate common objects. Whittling soft wood with a knife comes next. At first the wood is so marked that the mere careful whittling produces some well-known form. Soon the child can dispense with the marks and can copy a pattern. Later he can whittle forms to order without patterns. Following this come exercises with chisel, hatchet and saw; while the hammer is used to drive in a number of nails that outline known figures or patterns. A return is then made to exercises requiring greater delicacy of manipulation: patterns are outlined by pins on paper, or with needles and coloured thread on white muslin. And "the scissors are among our favourite instruments": from rags or newspapers forms are cut in imitation of patterns sup-

plied in card or wood. In this exercise there are four stages : at first the pattern is placed on the paper ; next it is placed in front of the pupil ; at the third stage of progress it is simply shown to the pupil and withdrawn ; finally the child cuts from memory whatever form is ordered. " There is no end," says Séguin, " to these exercises in drawing, which prepare the head as well as the hand for the realization of ideal types. When we consider that among men there is not one in a thousand who can use his hands to represent correctly a meaning . . . we are astonished that the lessons of substantial drawing taught to the idiots have not yet been carried into the public schools, where they could fill up the tedious intervals of book-learning. How many young women and men would like to exchange the knowledge of the height of the highest peaks on earth or moon against the skill of cutting in paper, or modelling in wax, the raw ideas which daily die unshaped in their minds, for want of power of realization by their hands."[39] From these exercises the idiot not only gains the power of expressing ideas of form by his hands, but also acquires the nervous power and control of the hand which are essential for success in drawing and writing.

When the drawing lessons are resumed teacher and pupil use a blackboard and chalk. The former

39 *Idiocy,* etc., p. 121.

draws a definite line in a definite position and is imitated by the latter. Other lines are added and various combinations arranged, all of which are slowly and carefully copied. The exercises provide for perpendicular, horizontal, and parallel lines : oblique lines are taught by drawing triangles. The idea of relationship in lines and figures must be developed. Curved lines are similarly taught, and then practice is given in drawing figures that combine straight and curved lines. It is easy to see how simply writing can be evolved from these exercises. The letters are drawn and imitated just like other combinations of curves and straight lines. When he has written a group of them he is shown their ordinary printed forms and is taught their names. Other groups are similarly taught, and every care that ingenuity can suggest is taken to vary the order of the letters and to prevent their recognition being dependent upon position or arrangement. Séguin says that normal children very frequently place exaggerated reliance on localisation.

The primary object of these writing exercises is the higher training of sight, and they are not to be regarded as directly preparing for the teaching of reading. For the latter purpose Séguin adopted the method of Jacotot, which had been introduced into the New York State Asylum for Idiots by the Director, Dr. Wilbur. So he taught words as

wholes, the child being led to perceive that each word has a *form*, a *name*, and a *meaning*. Such words as *bread, apple, book,* printed on cards are placed before him, and their forms and names carefully taught. They are pointed out and he reads them, read to him and he points them out, while again and again their order is changed. The things themselves are then introduced and placed beside the corresponding cards, after the method of Itard. By several tests and exercises the associations between the things and their written or oral names are permanently established. In the application of these tests and exercises Séguin observed three periods or stages: "1st. We say 'bread,' he must show the bread and oppose to it its written name. 2nd. We show him a piece of bread, he must say 'bread,' and put the word *bread* on the piece. 3rd. We show him the written name, he must show us the piece and give the name."[40] Other things and names are taught similarly, and progress though very slow is marked. This intensive work is done with the pupil individually: it requires great concentration of the idiot's feeble powers, and all distractions must be avoided. As soon, however, as he has made sufficient progress to be helped rather than distracted by the presence of other children doing the same work the stimulus of group teaching is em-

[40] *Idiocy*, etc., p. 127.

ployed. Cards containing written words are passed from hand to hand, for example, each child as he receives one pronouncing the word aloud, voice and sight and hand movements being stimulated. This is a rapid exercise and is greatly enjoyed by the pupils. It is worthy of emphasis that in all his teaching Séguin insists upon this alternation of individual and group work. He thus sums up the progress through the teaching of language to the more direct and specific intellectual education: "Cries have been converted by music into voices; articulation was derived from personal imitation concentrated in the organs of speech by mimicry; speech was treated as a combination of voice and articulation enforced by wants; writing was deduced from objective imitation; reading was the result of the combination of both speech and writing; letters are taught only as a study of contrast and analogy between their shapes or between their sounds; reading begins by words, each word having a shape or configuration, a name, and a meaning: hence solidarity is established between writing, reading, speaking, and soon understanding; so that the learning of one of them carries with it the knowledge of all."[41]

INTELLECTUAL EDUCATION.

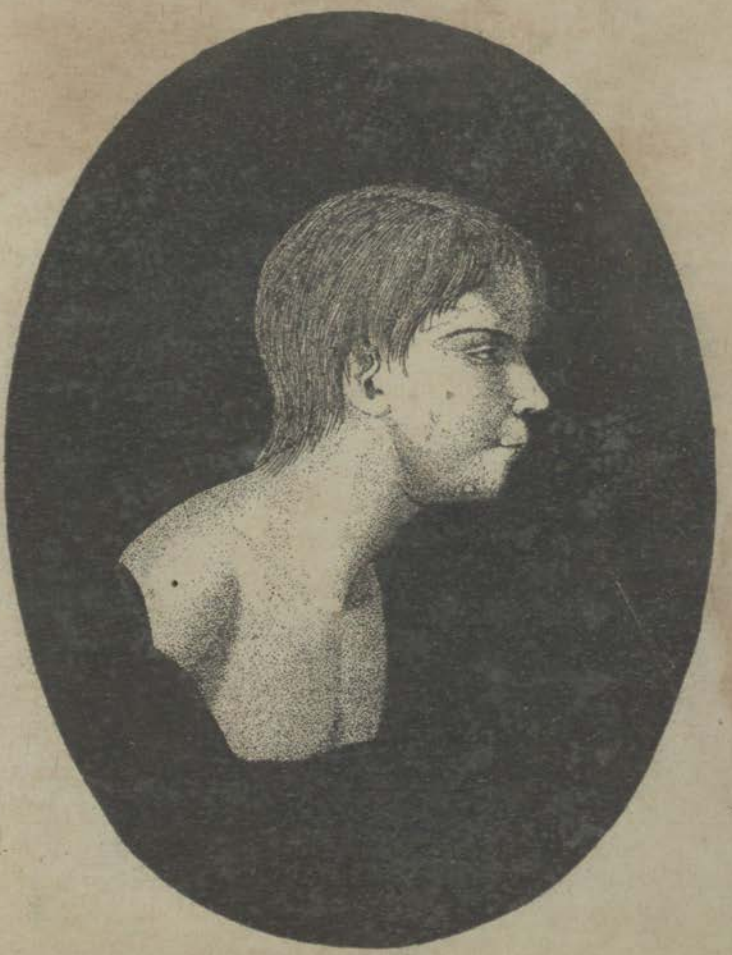
Every exercise so far employed by Séguin has had, of course, either a direct or indirect influence

[41] *Idiocy*, etc., p. 126.

in awakening and developing the intellectual powers. Many of them have been as effective for that purpose as if they had been specifically designed to meet the requirements of mental education. It thus follows that comparatively little remains to be achieved. Through the more facile and more accurate functioning of his senses the pupil has amassed a considerable quantity of varied materials upon which he may now be made to exercise his thought. He has acquired notions of bodies and their properties—form, size, combination, odour, savour, hardness, softness, weight, plasticity, and so on; as well as simple notions of relation—distance, arrangement, direction, and others. It remains to extend as far as possible his knowledge and appreciation of relations, including the more complex, to educate and exercise his intellect in the formation of *ideas,* and to cultivate the memory and the imagination. Notions must be combined and developed to form ideas. The notion and the idea are respectively " the incipiency and the conclusion of the operation of a single function; the function of reflecting all we can of the world into our microcosm." The child has a *notion* of a knife when he can distinguish it from other objects, or of an equilateral triangle when he can correctly copy it: he has an *idea* of the knife when he can connect it with its uses in work or at meals; he has an idea of the equilateral triangle if he knows that its three

sides are equal. Through ideas he forms a great number and variety of relations and associations, especially through the ideas acquired during his reading and general language lessons. The subject matter of his early reading lessons is concerned with persons, things, and such feelings as are readily appreciable by his feeble mind, and all are identified with their names. Knowledge grows through experience in identifying things and names. But neither the notion nor the knowledge thus acquired satisfies even the lowest idiot for long. He is not content with merely distinguishing the shape of a body: he touches it or licks it to ascertain some of its other qualities. This lesson must not be lost on the teacher who should proceed as soon as possible to teach appreciation of properties and qualities systematically. Attention will first be directed to those perceived in previous sense-training exercises, but they are not to be studied longer than is necessary to fashion the pupil's analytical power.

Beyond this stage the grand means for achieving further intellectual and moral progress is the true object-lesson, or "qualification lesson," as Séguin prefers to call it, which "derives its most important advantages from its degree of idealization." It must not be confined to mere material qualities but must elevate the mind by helping the formation of ideas and the development of ideals. He points



THE SAVAGE OF AVEYRON.

out the vast difference between the child who has merely been taught to remember the parts and elements of a vegetable and the one who is taught to grow it; and between one who has been taught to grow it for himself and another who has learned to produce it for the good of those more destitute than himself.

The majority of idiots have great difficulty in appreciating number, though some possess very remarkable mathematical ability, and are wonderfully skilled in the mechanical arrangement of figures and in making calculations. The greater number, however, cannot count three. At first Séguin taught numeration with objects and their qualities more than with figures: fractions in particular were taught by means of objects. Figures were used later when the power of calculating had been developed.

Concurrently with his education, through names, qualities, and number the child must acquire distinct ideas of the meaning of actions and relations. This involves his learning the parts of speech, and we begin with verbs, which denote actions by which men and things are constantly being connected and disconnected. In teaching verbs, as in nearly all his object-lesson work, Séguin followed the methods of Itard: the child who did not understand a verb was made to perform the action it denoted, and this was associated with the word. Thus his own name and

the word *apple* were written on the blackboard some distance apart. Between the two such verbs as *take, roll, raise* were written and he was taught to do as they directed. Later on this exercise was made more complex in group teaching when one pupil, in his turn, wrote verbs and the others performed the actions. These lessons in action and relation are considerably extended and increased in value through the teaching of prepositions by the same methods. They can also be taught by pictures such as those in Sadler's *Pratique de la Langue Française* which show birds in mnay positions in relation to a cage. Adjectives have already been taught during the study of qualities: and as participles and adverbs resemble adjectives in function they can be taught in the same manner. The substitution of pronouns for nouns is comparatively easy. "Interjections are taught practically by transferring to the blackboard those which come out naturally from the chest."

When all this has been accomplished and when, as a consequence, the functions have been elevated "to the intellectual excellencies of faculties" it only remains for the teacher of idiots to finish the education of faculties themselves as if they were simple functions. And he does this by further developing and turning to practical account the two most general "faculties"—memory and imagination—which do so much to give permanence and

higher meaning to the knowledge, ideas, and ideals gradually acquired, and to relate these pupils to society by enabling them to take their places among its humble but useful and amenable members. And so to relate them to society—to enable them to escape from the shackles of economic dependence—is one great aim of their educator. Whatever further formal education they may be capable of receiving can be imparted to them by the teachers of ordinary schools.

It very frequently happens that the memory of the idiot is limited to some special capacity such as musical imitation, counting, or mechanics. Such special memory is of very little value for general education or for the needs of life ; so no effort must be spared to widen and strengthen it by exercises that relate it to daily work and experience. To this end a great deal has already been done by the majority of the lessons described in this chapter ; but special attention must now be given to training the mind to remember for practical purposes. To this end the pupil must first of all be made to remember the essential facts of bodily hygiene and conduct, including cleanliness of person, clothing and habit ; correct standing and walking, dressing and eating. Later on effort must be made to give him permanent ideas in regard to the value of time, money, food, fuel, light, clothing, home, work, and their relations to the duties, comfort, happiness or

misery of himself and others. In all this instinct, pleasure, and a natural desire for comfort, for the convenience of order, and for the recurrence of what pleases and helps, have acted as powerful incentives to the retaining and combining of recollections concerned with the commonplace things and relationships of daily life. As soon as his developing intelligence permits the pupil must be enabled to acquire lasting moral, social, and æsthetic impressions, as of kindness, justice, and beauty: "At this point memory looks so different from what it is in most animals, or in men unfortunate enough to be shut up in natural idiocy, or in artificial imbecility by ignorance and egotism; it is so elevated and so much of a generalizer; it is so potent to reproduce images, even of the abstract, with the vividness of creation, that its name is henceforth imagination.[42] Memory connects the past and the future in the present of the individual and facilitates the regulation and development of his highest as well as his lowest activities: imagination, however, connects him with the whole race and with all time. Commencing as early as possible and, as in the case of memory, as low as necessary, the educator must use every effort to cultivate the formation and expression of images. Pictures, recitations, dialogues, and animated narratives will be of the greatest value here by adding forms to facts,

[42] *Idiocy*, etc., p. 137.

colours to forms, and movement to the whole. And through the education of his imagination even the poor idiot child may slowly be led towards the higher levels of thought and endeavour reached by his race.

MORAL EDUCATION.

Every exercise and expedient so far considered has had more or less obvious influence in the moral education of the idiot child. Moral education, according to Séguin, is ultimately based upon physical education, and is achieved through the harmonious development of all organic potentialities by which the child is related to his world. Morality embraces all the relations of an individual with himself and with his fellows, and it is to be acquired gradually by actually living out these relations on right lines. But such living-out can only be done by one whose mind is being educated ; and the only way in which this can be done is through the education of the muscular, sensorial, and nervous systems. Thus the moment we begin our educational work with the idiot and bring our will to bear upon him, we begin to prepare him for the ultimate acquisition of morality. And Séguin says that to give a detailed account of his methods and means of moral training would simply involve the re-writing of his book from a different standpoint. Nevertheless,

it is necessary for the sake of completeness and clarity of exposition to examine briefly the principles underlying the moral education of the idiot.

"The influences destined to give moral impulse to the very life of the idiot come upon him from prearranged circumstances, from prepared association with his fellows, and, above all, directly from the superior will which plans and directs the whole treatment."[43] Among those influences is the discipline of "things as they are," of the order, routine, and physical control in the school. Imitation of teacher and fellow-pupils also plays a part. Physical correction is useless and severity is merely cruelty. No punishment of any kind should be inflicted unless it is clear that the child knew *before* he committed it that the act in question was wrong. Similarly no rewards should be given unless the pupil understands their meaning. Caresses, too, which have great influences for good or evil, must be very judiciously used. When about to exercise his authority, to impose his will, to exact obedience, the teacher must take care that time, place, and general surroundings are favourable: obedience must be easily possible for the pupil and easily enforceable by the teacher. There must not be aroused any "fatal antagonisms" or unnecessary conflicts of wills. Coercion will occasionally be required and should be employed with kindly firm-

[43] *Idiocy*, etc., p. 149.

ness. One great guiding principle is that it is easier to repress than to compel actions. Our first orders, those which *must* be obeyed or we fail, must relate to that " which can be made to be," and should, according to the above principle, be prohibitions. Much in the way of desirable repression can be accomplished by the eye of the teacher, and by his firm, strong, pleasant, insinuating, and dominating *calmness*.

Mere passive obedience to authority, passive submission to a superior will or to the influence of time, place, and circumstance, must not satisfy the educator. The passivity must give way to moral activity : the control of the child's moral life must pass from other wills to his own ; it must be a self-regulating life, whose spring is within his aroused and developed conscience. His educator must aim at enabling him ultimately to enjoy freedom of will, liberty of action, moral spontaneity. And the tendencies inherent in and the activities begotten by this spontaneity will be preponderantly social if his education has been successful. Séguin is very insistent upon the vital necessity of educating the idiot child into a social being in the truest sense. Every effort must be made to avoid developing him into a mere egotist of respectable habits. As soon as his intellectual progress permits he is taught to help others as he is helped himself : and one of the great teacher's chief rewards was the joy he

experienced on many occasions in seeing pupils of some little advancement spontaneously helping their weaker and more backward fellows. The great agency for socialising these and, indeed, all pupils is love. "To develop their sense of affection," he says, "as were developed their senses of sight, of hearing, and others, does not demand new instruments, or new teachers, but the extension of the same action upon their feelings. To make the child feel that he is loved, and to make him eager to love in his turn, is the end of our teaching as it has been its beginning. If we have loved our pupils, they felt it and communicated the same feeling to each other; if they have been loved, they are loving in all the degrees of human power conformable with their limited synergy. We should like to say how this is to be accomplished; but who can tell? . . . In its march it begins with the most profound feelings of pity and charity for the unfortunate; it continues through compulsory, impulsing, or inciting commands; a work ever changing in form, never changing in object; unremittingly coaxing the isolated child into society; it is throughout a work of devotion . . . For our pupils science, literature, education, medicine, philosophy, each may do something; but love alone can truly socialise them; those alone who love them are their true rescuers."[44]

[44] *Idiocy*, etc., pp. 170 and 171.

They live and enjoy living in happy association with one another and with those who educate and care for them. Sports and games of many kinds are arranged in which they take active part in groups as large as possible. They are provided with numerous toys in great variety, preference being given to those that are easily renewed when destroyed; and many of these playthings are to be enjoyed *in common*. In regard to games and toys Séguin wisely says: "We would avoid, as much as possible, toys used individually for children addicted to loneliness, and try to give a social character to those which are generally made to amuse a single child; the more numerous the players, the more lively and social is the game; we can never teach too many children, nor too often, with toys. They may be taught in school many things utterly useless for their improvement; but they cannot be made to play together, with or without toys, without learning and increasing their moral qualities: playing is a moral power, amusing the lowest idiot is another; our children must enjoy both."[45] He goes on to point out that in school, at meals, in the field or the playground the educator has numerous opportunities of placing them "in relations which shall create their sense of moral association, their sociability, and their family-like affinities." When the pupil has progressed

45 *Idiocy*, etc., pp. 169 and 170.

sufficiently every effort is made to relate him to the larger world through the sights and wonders of civilisation. He is taught to enter freely into the life of normal people, and is taken to church, to theatres, to museums, to meetings and shows, thus arousing in him " a desire of mingling with yonder world" and that " pregnant curiosity which is of itself one of the mainsprings of life." By these means, slowly but surely, the child is taken " out of himself," and his moral thought and conduct become socialised. And this socialised morality is the ultimate end of Séguin's physiological education.

It is worthy of note that among the most powerful incentives to moral activity and " incitations to spontaneity" he gives chief place to the pupil's organic and acquired needs, his desires, tastes and affections. And Séguin's thought and work are in close accord with the best educational theory and practice of to-day not only because of his insight into the profound biological and developmental significance of these needs and of the instincts and motives associated with them ; but also because of his reverence for and constant endeavour to develop individuality or " true originality " ; his meticulous study of the peculiar endowment of each pupil and his opposition to " violent sameness" in general education ; his realisation of the influence of environment, of the need for adaptation thereto,

and of the importance in this and other connexions of imitation, play, and the "factor of use"; his sane views on the social and spiritual aspects and meaning of education; and finally, because he placed among the chief ends of education the elevating of the pupil to those levels of progress whereon he can exercise and enjoy freedom of will, liberty of physical, mental, and moral activity, and purposeful spontaneity. His conception of education was essentially biological in that he studied its problems and possibilities by studying the educable organism, environment, and function. He realised the continuity of the educative process necessitated by the grand unity of the educand, and writes thus: "From the feeling of pressure on the tactile organs which taught prehension, to our feelings of duty towards our pupils which taught them affection; from the distinction of the difference between a circle and a square, and that between affirmation and negation, or between right and wrong, we have followed a continuous path, beginning where the function awakes to the perception of simple notions, finishing where the faculties refuse to soar higher in the atmosphere of idealism. Perception producing simple notion, faculty producing ideas more and more complex and abstract, are the extreme terms of the chain, beginning at the peripheric extremity of the nerves, ending in the hemispheres."[46] And

[46] *Idiocy*, etc., p. 139.

again: "We looked at the rather immovable, or ungovernable mass called an idiot with the faith that where the appearance displayed nothing but ill-organised matter, there was nothing but ill-circumstanced animus. In answer to that conviction, when we educated the muscles, contractibility responded to our bidding with a spark from volition; we exercised severally the senses, but an impression could not be made on their would-be material nature, without the impression taking its rank among the accumulated idealities; we were enlarging the chest and new voices came out from it, expressing new ideas and feelings; we strengthened the hand, and it became the realiser of ideal creations and labour; we started imitation as a passive exercise, and it soon gave rise to all sorts of spontaneous actions; we caused pain and pleasure to be felt through the skin or the palate, and the idiot, in answer, tried to please by the exhibition of his new moral qualities: in fact, we could not touch a fibre of his, without receiving back the vibration of his all-souled instrument."[47]

[47] *Ibid*, p. 142.

CHAPTER IV.

MARIA MONTESSORI (1870—).

"THE MONTESSORI METHOD" is now so well known to students of education, and so many excellent works have already been written in detailed exposition and criticism of its principles and practice, that for the purposes of this chapter it will suffice to consider in broad outline its history, fundamental conceptions, didactic apparatus and procedure, in order that its relations to, and the degree of its dependence upon, the work of Pereira, Itard, and Séguin may become clear.

Maria Montessori was born in the year preceding the consummation of Italian independence and unity under the constitutional monarchy of Victor Emmanuel. The only child of middle-class parents who were not very well-to-do, the thoughtful girl grew up amid the new social, political and economic conditions that were rapidly developing with the expanding national life of the free and united people. The modest rank and financial resources of her family brought to her studious mind direct personal knowledge of many of the pressing problems of life, and to possible solutions for these she devoted

much thought even before she reached the age of womanhood. She played a notable part in the great movement for the emancipation of women from the thraldom of prejudice and convention and for the extension of their spheres of interest and activity. In defiance of one very strong prejudice of the time she became a student in the medical school of the University of Rome, and was the first woman in Italy to take the degree of Doctor of Medicine.

Upon the completion of her medical course she was appointed assistant doctor of the Psychiatric Clinic of the University. But while devoting herself assiduously to the various duties of this post she had visions of a greater work awaiting her. The study of the thyroid gland and the various abnormalities due to its defects was then developing, and as a consequence the attention of many physicians was being directed to defective children. Dr. Montessori had early begun to specialise in children's diseases, more particularly those of a mental nature; and she soon perceived that for the cure of the latter education could offer more potent means than medicine. "The fact that pedagogy must join with medicine in the treatment of disease was," she writes, "the practical outcome of the thought of the time. And because of this tendency the method of treating disease by gymnastics became widely popular. I, however, differed from

my colleagues in that I felt that mental deficiency presented chiefly a pedagogical, rather than mainly a medical, problem."[1]

Part of her duty consisted in frequently visiting the insane asylums of the city to study the patients and select from among them suitable subjects for the clinic. During these visits she became interested in the idiot children whom she found at the asylums, for at that time all such children were housed along with the insane. Interest led to inquiry and she soon " became conversant with the special method of education devised for these unhappy little ones by Edward Séguin."[2] The latter's work confirmed her belief that the amelioration of the sad lot of the idiot child must be achieved by educational rather than by medical means. To this belief she gave public expression at the Pedagogical Congress at Turin in 1898. " I believe," she says, " that I touched a chord already vibrant, because the idea, making its way among the physicians and elementary teachers, spread in a flash as presenting a question of lively interest to the school."[3] As a result of this address on " Moral Education" the Minister of Education requested her to give a course of lectures to the teachers of Rome on the education of the feeble-minded child. From this lecture course there soon developed the State

1 *The Montessori Method*, p. 31.
2 *Ibid.*
3 *Ibid*, p. 32.

Orthophrenic School of which she was in charge for more than two years during 1898 to 1900. To this institution were transferred such pupils of the public elementary schools as were considered hopelessly deficient. Later through the assistance of a philanthropic association it was found possible to add to these all the idiot children from the insane asylums of the city. During the two years she directed this school Dr. Montessori not only took the chief part in the training of special teachers in the observation and education of the defective pupils, but was also engaged many hours daily in teaching the children herself. Nor did she rely entirely upon her own knowledge and experience. She visited during this period both London and Paris for the purpose of studying in a practical way the best methods in use in these cities for the education of the mentally deficient, and on her return she devoted almost all her school hours to the actual teaching of her pupils, being present from eight in the morning till seven in the evening.

From the beginning of her practical teaching at the Orthophrenic School Dr. Montessori felt that the methods she employed, which were, as we shall see, mainly those of Séguin, had nothing in them to limit their application to the development of idiots. She felt, indeed, that the principles upon which they were based were *more rational* than those underlying the usual practice of the ordinary

schools—" so much more so, indeed, that through their means an inferior mentality would be able to grow and develop. This feeling, so deep as to be in the nature of an intuition, became my controlling idea after I had left the school for deficients, and, little by little, I became convinced that similar methods applied to normal children would develop or set free their personality in a marvellous and surprising way."[4] Her later and more thorough study of Séguin's work revealed to her that her great inspirer had himself realised not only the possibility but the great desirability of applying his principles and methods in the education of the normal child. Dr. Montessori was also influenced in this direction by the works of famous Italian anthropologists and chiefly by those of Giuseppe Sergi. Following the methods of Lombroso, who applied the principles of anthropology to the study of criminology, and of De Giovanni, who employed them in the practice of medicine, Sergi sought to found upon them a scientific education. " To-day in the social world," says Sergi, " an imperative need makes itself felt—the reconstruction of educational methods ; and he who fights for this cause, fights for human regeneration." In his pedagogical writings collected in a volume under the title of *Educazione ed Instruzione* (Pensieri),[5] he gives a *résumé* of the lectures in which he encouraged

[4] *Op. cit.*, p. 33.
[5] *Trevisini*, 1892

this new movement, and says that he believes the way to this desired regeneration lies in a methodical study of the one to be educated, carried on under the guidance of pedagogical anthropology and experimental psychology.[6]

Completely convinced at last of the soundness of her own and Séguin's views as to the value of the physiological method in the education of normal children, Dr. Montessori abandoned for a time her personal teaching of defectives and the training of their teachers and devoted her energies to further observation, experiment and thought. Not only did she enter upon what she calls " a genuine and thorough study" of remedial pedagogy, but also registered as a student of philosophy at the University of Rome in order that she might undertake an advanced study of normal education and its fundamental principles. "At this time," she writes, " I was registered at the University as a student of philosophy, and followed the course in experimental psychology, which had only recently been established in Italian universities, namely, at Turin, Rome and Naples. At the same time I made researches in Pedagogic Anthropology in the elementary schools, studying in this way the methods in organisation used for the education of normal children. This work led to the teaching of Pedagogic Anthropology in the University of Rome."[7]

[6] *Montessori, op. cit.*, pp. 2 and 3.
[7] *Ibid*, p. 42.

Her " genuine and thorough study" of remedial education was mainly concerned with the work of Séguin and of her other great inspirer, Dr. Itard. In the work of the latter she finds the origin of the methods for the education of deficients. " He was," she says, " the first to attempt a methodical education of the sense of hearing. He made these experiments in the institute for deaf-mutes. . . . Later on, having in charge for eight years the idiot boy known as ' the wild boy of Aveyron,' he extended to the treatment of all the senses those educational methods which had already given such excellent results in the treatment of the sense of hearing. A student of Pinel, Itard was the first educator to practise the *observation* of the pupil in the way in which the sick are observed in the hospitals, especially those suffering from diseases of the nervous system."[8] In our chapter on Pereira we have seen that the education of defectives has a very much earlier origin than that assigned to it in the above passage. And in our introductory chapter we have seen that Dr. Montessori does not show in her writings any direct knowledge of Pereira's work, and is consequently unaware of his practice of scientifically observing and examining his deaf-mute pupils, and of his pioneer work in the education of the senses. She is wrong too in assuming that Itard's work with

8 *Ibid,* pp. 33 and 34.

deaf-mutes prepared the way for his education of the wild boy. The fact is, as we have already noted, that while endeavouring to train this boy's sense of hearing he made observations and experiments that were of great value in his subsequent education of the deaf. The wild boy's education too did not continue for eight, but only for about four years. "The pedagogic writings of Itard," she adds, "are most interesting and minute descriptions of educational efforts and experiences, and anyone reading them to-day must admit that they were practically the first attempts at experimental psychology."[9] We shall find evidence later that she was profoundly impressed as well as guided and helped by Itard's inspiring pamphlets.

On the connexion between Séguin and Itard she writes: "But the merit of having completed a genuine educational system for deficient children was due to Edward Séguin, first a teacher and then a physician. He took the experiments of Itard as his starting point, applying these methods, modifying and completing them during a period of ten years' experience with children taken from the insane asylums and placed in a little school in Rue Pigalle in Paris."[10] Dr. Montessori is unaware of the inspiration derived by Séguin from the wonderful work of Pereira.

[9] *Op. cit.*, p. 34.
[10] *Ibid.*

Very shortly after her graduation she had begun the close study of Séguin's first great work, *Traitement Moral, Hygiène et Education des Idiots,* published in French in 1846. For a long time, however, she was unable to obtain a copy of his later work, *Idiocy: and its Treatment by the Physiological Method,* published in English in America in 1866. This great book was unknown to or forgotten by those of her acquaintance who ought to have been thoroughly conversant with its contents, and the consequences were deplorable. She made a vain quest for it, going, as she says, from house to house of nearly all the English physicians who were known to be specially interested in deficient children, or who were superintendents of special schools. The fact that this book was unknown in England although it had been published in the English language, made her think that Séguin's system had never been understood. In fact although Séguin was constantly quoted in all the publications dealing with institutions for deficients, the educational applications described, were, she found, quite different from the applications of Séguin's system. Almost everywhere the methods employed in the education of deficients were more or less similar to those in use in ordinary schools. German educators, she found, maintained as a principle the use of the same methods for defective and normal pupils. She spent some time at Bicêtre, and even there, where

the educators had the French text in their hands, it was the didactic apparatus far more than the method of the master that was in use. She says that the teaching there was merely mechanical, each teacher following the rules in a merely literal manner. "After this study of the methods in use throughout Europe," she writes, " I concluded my experiments upon the deficients of Rome, and taught them throughout two years. I followed Séguin's book, and also derived much help from the remarkable experiments of Itard."[11] She perceived and was deeply impressed by the *spiritual* nature of the thought and work of the former. One day a directress in the Institution for Deficients drew her attention to the thirty-seventh chapter of the book of *Ezekiel* in which he prophesies the revival of the dead hope of Israel; and the words of the prophet recalled to her the spirit and work of her great master.

The following passage reveals the thoroughness of her study of the works of the two men who did so much to inspire and guide her. " Having through actual experience justified my faith in Séguin's method, I withdrew from active work among deficients, and began a more thorough study of the works of Itard and Séguin. I felt the need of meditation. I did a thing which I had not done before, and which perhaps few students have been

[11] *Op. cit.*, p. 36.

willing to do,—I translated into Italian and copied out with my own hand, the writings of these men, from beginning to end, making for myself books as the old Benedictines used to do before the diffusion of printing. I chose to do this by hand, in order that I might have time to weigh the sense of each word, and to read, in truth, the spirit of the author. I had just finished copying the 600 pages of Séguin's French volume when I received from New York a copy of the English book published in 1866. The old volume had been found among the books discarded from the private library of a New York physician. I translated it with the help of an English friend. This volume did not add much in the way of new pedagogical experiments, but dealt with the philosophy of the experiments described in the first volume. The man who had studied abnormal children for thirty years expressed the idea that the physiological method, which has as its base the individual study of the pupil and which forms its educative methods upon the analysis of physiological and psychological phenomena, must come also to be applied to normal children. This step, he believed, would show the way to a complete human regeneration. The voice of Séguin seemed to be like the voice of the forerunner crying in the wilderness, and my thoughts were filled with the immensity and importance of a work which should be able to reform the school and education.''[12]

[12] *Op. cit.*, pp. 41 and 42.

Having through this thorough mode of study become intimately acquainted with her forerunners' educational principles and with the details of their experiments and expedients, and imbued with their noble spirit, Dr. Montessori resumed the teaching of deficient children and arranged some original experiments. Of this work, she writes: "This is not the place for a report of these experiments, and I will only note that at this time I attempted an original method for the teaching of reading and writing, a part of the education of the child which was most imperfectly treated in the works of both Itard and Séguin. I succeeded in teaching a number of the idiots from the asylums both to read and to write so well that I was able to present them at a public school for an examination together with normal children. And they passed the examination successfully."[13] To those who saw this result of her work the success appeared almost miraculous. The teacher herself realised, however, that nothing in the nature of a miracle had been achieved: her idiot pupils had been able to compete with normal children simply because they had been taught scientifically. "They had been helped in their psychic development, and the normal children had, instead, been suffocated, held back." To her the result of that examination afforded conclusive proof that the

[13] *Op. cit.*, p. 38.

methods of education in use in ordinary schools were not only based upon unscientific principles which were not in accord with child nature and its developmental needs, but were also applied without regard to that nature and its needs. It ought not to have been possible to raise the attainments of her idiot pupils in reading and writing so close to the level usually reached by the ordinary pupil. She found herself thinking, she says, that if some day, the special education which had developed these idiot children in such a marvellous fashion, could be applied to the development of normal children, the 'miracle' of which her friends talked would no longer be possible. The abyss between the inferior mentality of the idiot and that of the normal brain, she points out, can never be bridged if the normal child has reached his full development. While everyone was admiring the progress of her idiot pupils, she was searching for the reasons which could keep the happy, healthy children of the common schools on so low a plane that they could be equalled in tests of intelligence by her unfortunate pupils.

So far Dr. Montessori had not had an opportunity of personally applying her methods in the education of normal children, and very curiously she had not thought of seeking such opportunity in the various institutions where very young children were cared for. In January, 1907, however, her great chance

came unsought. Signor Eduardo Talamo, the director of a philanthropic society called the Roman Association for Good Building, had conceived the novel and happy idea of providing in every tenement erected and controlled by his Association a large room in which it would be possible to gather together and educate all the children of the tenement who were between the ages of three and seven. The play and work of these little ones were to be supervised by a special teacher who would reside in the tenement. Dr. Montessori was invited to organise these "schools within the house," and eagerly undertook the task. For this new kind of school her friend Signora Olga Lodi, suggested the happy name of *Casa dei Bambini, The Babies' House,* and under that name the first was opened in the Via dei Marsi on January 6th, 1907. Others soon followed both in the poorer and middle-class areas, and all proved successful.

As justifying the application of her methods to the work in these schools, Dr. Montessori found a parallel between the deficient and the normal child who is very young: "*the child who has not the force to develop* and *he who has not yet developed are in some ways alike.*" The latter has not yet developed the power of co-ordinated muscular movements, and so walks and performs other ordinary acts of life in an imperfect manner: he has, for example, no skill in the fastening and unfastening

of garments. His organs of sense are not completely developed, as may be seen, for instance, in the weak power of accommodation of the eye. His language is primitive and is marked by many characteristic defects. The normal infant and the deficient child are alike in their general instability and in their feeble power of fixing their attention. She points out, further, that Preyer, in his psychological study of children, illustrates the parallel between pathological linguistic defects and those of the normal child in the process of developing. From all this it should follow that methods of education which made possible the considerable mental development of the idiot ought to aid the development of the ordinary child, "and should be so adapted as to constitute a hygienic education of the entire personality of a normal human being."

Towards the end of her brief history of her method Dr. Montessori again expresses her indebtedness to Itard and Séguin in these terms: "Here lies the significance of my pedagogical experiment in the 'Children's Houses.' It represents the result of a series of trials made by me, in the education of young children, with methods already used with deficients. My work has not been made in any way an application, pure and simple, of the methods of Séguin to young children, as anyone who will consult the works of the author

will readily see. But it is none the less true that, underlying these two years of trial, there is a basis of experiment which goes back to the days of the French Revolution, and which represents the earnest work of the lives of Itard and Séguin. As for me, thirty years after the publication of Séguin's second book, I took up again the ideas and, I may even say, the work of this great man, with the same freshness of spirit with which he received the inheritance of the work and ideas of his master Itard. For *ten years* I not only made practical experiments according to their methods, but through reverent meditation absorbed the works of those noble and consecrated men, who have left to humanity most vital proof of their obscure heroism.

Thus my ten years of work may in a sense be considered as a summing up of the forty years of work done by Itard and Séguin. Viewed in this light, fifty years of active work preceded and prepared for this apparently brief trial of only two years, and I feel that I am not wrong in saying that these experiments represent the successive work of three physicians, who from Itard to me show in a greater or less degree the first steps along the path of psychiatry.''[14] Thus she pays generous tribute to her two great inspirers. As we have seen in our introductory chapter, Dr. Montessori in these passages definitely groups herself with

[14] *Op. cit.*, pp. 45 and 46.

Itard and Séguin, acknowledges once again the inspiration which she received from them, and clearly concatenates her work with theirs.

Her direct personal association with the Children's Houses continued for about four years. During that period she trained the teachers and superintended and guided their efforts, while continuing her own observational, experimental, and teaching work. In the light of her growing experience in the education of normal children she was able to modify and extend the methods originally based on the study of idiots and other mentally deficient children. Gradually the knowledge of her principles and practice spread through Italy and other countries. *McClure's Magazine, The World's Work,* and the *Fortnightly Review* did much to inform the English-speaking educational world of the work that was being done in the Children's Houses at Rome. And when satisfied with the approach her system had made towards completion Dr. Montessori published her own *Il Metodo della Pedagogia Scientifica applicato all' educazione infantile nelle Case dei Bambini,* which appeared in English in 1912 under the unsatisfactory title of *The Montessori Method.* The English edition contains two chapters which were not included in the original Italian work, and these treat more fully of discipline and obedience and discuss some further conclusions and impressions,

Since 1911, Dr. Montessori has not been associated personally with the Children's Houses or very intimately with the actual work of any school in which her methods are employed. She has made it very clear that a great deal remains to be achieved along the lines suggested by her work; and this being true, it is, as Dr. Boyd points out, "unfortunate . . . there is no longer any institution in which her method is at work under her personal direction."[15] The intervening years have been devoted to efforts to promote the adoption of her method in many countries and to further study and experiment with a view to its application to the education of older children. The results of this further study were given to the world in a large work, in two volumes, which was translated into English and published in 1917 under the title of *The Advanced Montessori Method*. The first volume treats of "Spontaneous Activity in Education," and the second of "The Montessori Elementary Education." There has also appeared a practical treatise entitled *Dr. Montessori's Own Handbook: A Manual for Teachers and Parents*. In this country the Montessori Society has been formed for the following objects: "to help the diffusion of the Montessori Method by all possible means; to encourage the foundation of Montessori Schools either private or in connection with public

[15] *From Locke to Montessori*, 1917, p. 134.

schools; to guarantee, as far as possible, the integrity of its application; to defend it from misrepresentations and falsifications."

It is to be sincerely hoped that the Society, Dr. Montessori herself, and the increasing body of her disciples will not seek the achievement of the third object above in a narrow and jealous spirit. If the system of educational theory and practice in which they are all so deeply interested is to become permanent it must be allowed to grow and develop like the child to whose unfolding life it is sought to relate it so intimately. Especially must they avoid the danger of stunting or retarding its growth and development by a too rigorous insistence upon the continued use of the didactic apparatus as it is today. In regard to this last point Dr. Boyd has well said: "They (*i.e.*, " those who have accepted the system as a great new discovery") see the principles becoming effective through the apparatus and the apparatus getting its significance from the principles, and they regard them in their conjunction as an organic whole. But if the history of thought makes one thing clearer than another, it is that principles of any kind only become a permanent factor in the advance of the human spirit by shedding the forms in which they first gained recognition."[16]

[16] *From Locke to Montessori*, 1917, p. 180.

FUNDAMENTAL CONCEPTIONS.

The most fundamental of all Dr. Montessori's educational conceptions is this : That the child is an organism capable of *spontaneous* development, having inherent in him not only the tendency to develop all his potentialities, but also the power of using to that end the means to be found in his environment. Her whole body of educational doctrine and procedure is founded ultimately upon this conception of organic spontaneity. The tendency referred to is a definite, active, purposive "drive" or " urge," impelling the organism to engage in such activities as have developmental value. These activities are always either actions upon or reactions to the environment, which though of great importance is, according to Dr. Montessori, but a secondary factor in the existence and development of the vital processes. *"Environment,"* she writes, " is undoubtedly a *secondary* factor in the phenomena of life ; it can modify in that it can help or hinder, but it can never create. The modern theories of evolution, from Naegeli to De Vries, consider throughout the development of the two biological branches, animal and vegetable, this interior factor as the essential force in the transformation of the species and in the transformation of the individual. The origins of the *development,* both in the species and in the individual, *lie*

within. The child does not grow *because* he is nourished, *because* he breathes, *because* he is placed in conditions of temperature to which he is adapted, he grows because the potential life within him develops, making itself visible, because the fruitful germ from which his life has come develops itself according to the biological destiny which was fixed for it by heredity. Adolescence does not come *because* the child laughs, or dances or does gymnastic exercises, or is well nourished ; but because he has arrived at that particular physiological state. Life makes itself manifest—life creates, life gives ; and is in its turn held within certain limits and bound by certain laws which are insuperable. The fixed characteristics of the species do not change—they can only vary.

This concept, so brilliantly set forth by De Vries in his Mutation Theory, illustrates also the limits of education. We can act on the *variations* which are in relation to the environment, and whose limits vary slightly in the species and in the individual, but we cannot act upon the *mutations*. The mutations are bound by some mysterious tie to the very font of life itself, and their power rises superior to the modifying elements of the environment."[17]

Now, if the fruitful germ from which the child gets his life develops spontaneously according to

[17] *The Montessori Method,* pp. 105 and 106. In all our quotations from Dr. Montessori, the *italics* are hers.

fixed biological laws, what is the function of education? Dr. Montessori's answer is in effect that its function is to encourage the manifestations of spontaneity at their period of incipiency and to facilitate their fulfilment in such activities as will make for "a harmonious innate development." The greatest care must be taken lest in tendering help we interfere with spontaneity. Spontaneous acts, unless they are useless or dangerous, must never be suppressed: "We cannot know the consequence of suffocating a *spontaneous* action at the time when the child is just beginning to be active: perhaps we suffocate *life itself*. . . . If any educational act is to be efficacious, it will be only that which tends to *help* toward the complete unfolding of this life. To be thus helpful it is necessary rigorously to avoid the *arrest of spontaneous movements and the imposition of arbitrary tasks.*"[18] Again and again throughout the pages of *The Montessori Method* we find this doctrine repeated in one form or another. Thus: "By education must be understood the active help given to the normal expansion of the life of the child. The child is a body which grows, and a soul which develops,—these two forms, physiological and psychic, have one eternal font, life itself. We must neither mar nor stifle the mysterious powers which lie within these two forms of growth, but we

[18] *Ibid.*, 87 and 88.

must *await from them* the manifestations which we know will succeed one another."[19] The greatest triumph of our educational method should always be this: *to bring about the spontaneous progress of the child.*"[20] And again: "So the spontaneous psychic development of the child continues indefinitely and is in direct relation to the psychic potentiality of the child himself, and not with the work of the teacher."[21]

Now, implicit in all this is Dr. Montessori's second basic principle—that there must be formulated a scientific pedagogy, an exact science of childhood. For, in order that the educator may *help* the spontaneous development of the child and avoid retarding, marring, misdirecting or suppressing it, he must understand the laws which it has to obey and the organic needs and impulses with which it is intimately associated. Every effort must be made to ascertain and systematise all the facts of child life, growth, and development. The scientific student of childhood must seek assistance from biology, anthropology, physiology, hygiene, and psychology, and utilise also the lore of the physician. But while all these sciences may greatly help in education by revealing and explaining many facts and aspects of child life, the educator must remember the essential unity of the child. The

19 *The Montessori Method*, pp. 104 and 105.
20 *Ibid*, p. 228.
21 *Ibid*, p. 230.

knowledge of greatest direct service is that obtained by observation of the pupil during the hours when he is spontaneously living his life. Dr. Montessori does not place much reliance upon the results of experimental investigations in psychological laboratories; for during the experiment the subject finds himself in an unnatural environment where he is tormented by instruments, circumscribed in his action and reaction, and prevented from spontaneously manifesting his psychic needs and modes of expression. In her introductory lecture to her first International Training Course, held in Rome in 1913, she said: "For the adequate study of man we require not a method precisely similar to methods formerly used by science, but a method analogous to them. When for instance it is desired to study the insects . . . what does the scientist do? He goes where the insects live naturally, taking care not to disturb them, so as to see exactly all their doings. What does the man who would study plants do? He goes where the plants grow naturally. To study the peronospera (a vine blight), the scientist seeks the affected vines. The bacteriologist tries to place the microbes in their natural environment. And in studying for the purposes of hygiene those pathological germs which are found in man, it is endeavoured to give the microbes conditions of life as similar as possible to those of their normal environment; soups and gelatins are prepared and kept at

the temperature of the human body. Why should we do otherwise in studying man? Why, peculiarly in the case of man must he be taken from his natural surroundings? Why put him in a laboratory and torment him with instruments? Why circumscribe his existence and submit him to the test of a second? Man, the great builder of civilisation?

Let us do only what we did when studying all other living beings. Let us observe him in his natural state. What do we do, however, when we wish to study living organisms? We give them the best conditions of life. We need to found a laboratory for the experimental study of man, which will give a group of human beings the best conditions of existence. . . . Give the best conditions of life, and then?—as is done with all other living organisms leave them free, and see what they do; disturbing them not at all, or as little as possible, though certainly helping them by every means in their development. Thus it is not enough to give the best living conditions but freedom must also be given . . . the place which is best adapted for real scientific research is undoubtedly the school."[22]

According to Dr. Montessori an environment is *natural* to an organism when it provides the best possible conditions of life: and the best possible

22 Quoted by C. A. Claremont, "Has Dr. Montessori made a true contribution to science?" Essay published 1920.

conditions of life are those in which the individual organism finds "all that is necessary for his development." And she claims that for the child of modern civilised life the school may be made such an environment: and when it is made so it becomes the ideal laboratory for the scientific study of childhood.

Implied in the foregoing are three other fundamental principles of the Montessori system which call for discussion in turn. They are, first, the principle requiring the scientific determination of the pupil's environment; second, the biological principle of liberty; and third, the principle that scientific pedagogy must be grounded upon the direct study of the *individual* and that individuality, personality, must be afforded full opportunity to reveal its characteristics and provided with all necessary means for organising and developing itself.

In her later and larger work, *The Advanced Montessori Method*,[23] she writes thus in regard to the first of these principles while assuming the second: "In order to expand, the child, left at liberty to exercise his activities, ought to find in his surroundings something *organised* in direct relation to his internal organisation which is developing itself by natural laws just as the free insect finds in the form and qualities of flowers a direct correspondence between form and sustenance. The

[23] Pp. 70 and 71.

insect is undoubtedly free when, seeking the nectar which nourishes it, it is in reality helping the reproduction of the plant. There is nothing more marvellous in nature than the correspondence between the organs of these two orders of being destined to such a providential co-operation.

The secret of the free development of the child consists, therefore, in organising for him the means necessary for his internal nourishment, means corresponding to a primitive impulse of the child, comparable to that which makes the new born infant capable of sucking milk from the breast, which by its external form and elaborated sustenance, corresponds perfectly to the requirements of the infant. It is in the satisfaction of this primitive impulse, this internal hunger that the child's personality begins to organise itself and reveal its characteristics. We must not therefore set ourselves the educational problem of seeking means whereby to organise the internal personality of the child and develop his characteristics ; the sole problem is that of offering the child the necessary nourishment. It is by this means that the child develops an organised and complex activity which, while it responds to a primitive impulse exercises the intelligence and develops qualities we consider lofty and which we supposed were foreign to the nature of the young child, such as patience and perseverance in work, and in the moral order, obedience, gentleness,

affection, politeness, serenity; qualities we are accustomed to divide into different categories and as to which, hitherto, we have cherished the illusion that it was our task to develop them gradually by our direct interposition, although in practice we have never known by what means to do so successfully."

Here the sole problem of education is reduced to its simplest terms: to provide the child with the best means for spontaneous development, for *auto-education*. These means are to form part of his specially arranged environment. And two obvious points for criticism are already met. First, the environment so prepared is not artificial for the child of modern society; it is natural in that it contains the best possible conditions for his physical, mental and moral development. Secondly, in such a definitely organised environment he is not deprived of his freedom any more than is the wild bee which finds its sustenance in the highly organised flower. And just as the structure and properties of the flower correspond with the bee's organic structure and needs, so must the means provided for the auto-education of the child correspond, as closely as science can determine, with his organic constitution and developmental needs. Dr. Montessori claims that her scientific study of childhood has enabled her to decide with a considerable approach to exactitude what these means should be and how

they should be used ; that her science of education, formulated on the results of direct observation, has determined not only the general organisation of the school environment in regard to spacing, hygienic conditions, furniture, decoration, and so on, but has also determined the nature, construction, grading, and use of her didactic apparatus. While leaving questions of the apparatus for later discussion it must be repeated that the scientific determination of the school environment is an essential basic principle of the Montessori system. Without such determination there can be no real laboratory and therefore no direct observation, under natural conditions, of the child's manifestations of spontaneity.

Much has been written concerning the Montessori principle of freedom. The majority of teachers and students of education appear to regard this as the one great fundamental principle by the acceptance or rejection of which by the educational world the system must stand or fall. In reality it is not so. As we have seen above the first essential basic principle is auto-education, the spontaneous development of the child ; the second is that which declares absolutely necessary the formulation of a science of pedagogy based on observation ; and the third is that which demands a natural environment in which spontaneity may manifest itself and in which its manifestations may be observed under the

best conditions. Now, all these principles require as an essential *condition* that the child shall have freedom—freedom to act spontaneously and to have inter-relations with the *prepared* environment. Unless his activities are free our observation of them cannot possibly procure trustworthy data for a science of education. This is the real significance of what Dr. Montessori calls "the biological concept of liberty in pedagogy." "From the biological point of view the concept of *liberty* in the education of the child in his earliest years must be understood as demanding those conditions adapted to the most favourable *development* of his entire individuality. So from the physiological side as well as from the mental side, this includes the free development of the brain. The educator must be as one inspired by a deep *worship of life,* and must, through this reverence, *respect,* while he observes with human interest, the *development* of the child life."[24] And in her later and fuller work in which she treats in greater detail of many matters incompletely dealt with in her first book, she says: "The contribution I have made to the education of young children tends, in fact, to *specify* by means of the revelations due to experiment the form of liberty in internal development; it would not be possible to conceive liberty of development if, by its very nature the child were not capable

[24] *The Montessori Method,* p. 104.

of a spontaneous organic development, if the tendency to develop his energies (expansion of latent powers), the conquest of the means necessary to a harmonious innate development, did not already exist. . . . In order that the phenomenon should come to pass it is *necessary* that the spontaneous development of the child should be accorded *perfect liberty;* that is to say that its calm and peaceful expansion should not be disturbed by the intervention of an untimely and disturbing influence; just as the body of the new-born infant should be left in peace to assimilate its nourishment and grow properly. In such an attitude ought we to await the *miracles* of the inner life, its expansions and also its unforeseen and surprising explosions. . . . But to ensure the psychical phenomena of growth, we must prepare the 'environment' in a definite manner and from this environment offer the child the external means directly necessary for him. This is the *positive* fact which my experiment has rendered concrete. Hitherto the liberty of the child has been vaguely discussed, no clearly defined limit has been established between liberty and abandonment. We were told: 'liberty has its limits,' 'liberty must be properly understood.' But a special method indicating how liberty should be interpreted and what is the intuitive *quid* which ought to co-exist with it had not been determined. The establishment of such a method should open

up a new path to all education. It is therefore necessary that the environment should contain the means of auto-education.''[25]

In order to understand clearly Dr. Montessori's principle of freedom it is of the first importance to grasp the essential fact that it is only for such spontaneous activities as have direct relationship with her *prepared* environment that she insists upon the granting of *perfect liberty*. She claims that her school environment, the most vitally important —even dominating—part of which is the special didactic apparatus, can be so scientifically prepared in strict accordance with the nature and needs of the child that it will be intrinsically attractive and satisfying to him, and that only on exceedingly rare occasions will he manifest any tendency to enter into other than desirable relationships with it. To the ordinary child the really interesting apparatus makes an irresistible appeal, absorbing attention, inciting to educative activity, and thus pleasantly but effectively preventing useless and dangerous conduct. Once the child comes under the pleasant, helpful, and alluring influence of this prepared environment no question as to the advisability of allowing him perfect freedom can arise. But if he has not yet come under that influence or if for any reason it is temporarily inoperative, and the

[25] *The Advanced Montessori Method,* Vol. I., pp. 70 and 72.

child as a consequence is guilty of useless or dangerous acts, they are immediately "*suppressed, destroyed.*"

On the moral side there is gradual definite development through the same outlet of spontaneity guided and controlled in and by the prepared environment. Gradually the moral personality arises through the constant exercise and consequent growth of the will. "When the child chooses from among a considerable number of objects the one he prefers, when he moves to go and take it from the sideboard, and then replaces it, or consents to give it up to a companion; when he waits until one of the pieces of the apparatus he wishes to use is laid aside by the child who has it in his hand at the moment; when he persists for a long time and with earnest attention in the same exercise, correcting the mistakes which the didactic material reveals to him; when, in the silence-exercise, he restrains all his impulses, all his movements and then rising when his name is called, controls these movements carefully to avoid making a noise with his feet or knocking against the furniture he performs so many acts of the 'will.' It may be said that in him the exercise of the will is continuous; nay, that the factor which really acts and persists among his aptitudes is the will, which is built up on the internal fundamental fact of a prolonged attention."[26] In

[26] *The Advanced Montessori Method,* Vol. I., p. 170.

this connexion Professor Nunn points out that there can be no "training of the will" apart from the general process by which the sentiments are built up, and adds: "Hence Dr. Montessori is right in maintaining that to train a child's will we must begin by leaving him free to work out his own impulses. For if he is constantly checked or constantly acts only on the directions of another, there can be no building up of strong sentiments to be the basis of effective and well-regulated conduct."[27]

In regard to the social aspects of freedom her general position is stated thus: "The liberty of the child should have as its *limit* the collective interest, as its *form,* what we universally consider good breeding. We must, therefore, check in the child whatever offends or annoys others or whatever tends towards rough or ill-bred acts. But all the rest,—every manifestation having a useful scope—whatever it be, and under whatever form it expresses itself, must not only be permitted but must be *observed,* by the teacher."[28] The carefully prepared environment in which the child is free to enter into numerous and varied relations with his fellows, affords ample opportunity, encouragement, incentive to the building up of social sentiments.

The fifth fundamental Montessori principle is that which insists upon the vital importance of the pupil's

[27] *Education: Its Data and First Principles,* 1920, p. 174.
[28] *The Montessori Method,* p. 87.

individuality. Always for her " the child" means the individual child. The spontaneity, the needs, the observation, the freedom, are always those of the individual. Child-life, all its manifestations, conduct, will, attention, intelligence, imagination—every topic discussed in her great study—are considered ultimately in their relation to the individual. " Now, child-life," she asserts, " is not an abstraction; *it is the life of individual children.* There exists only one real biological manifestation: *the living individual;* and toward single individuals, one by one observed, education must direct itself."[29] So the individual child is allowed to come and go freely, to use the apparatus when and how he chooses, to help others or seek help from them, and generally to manifest the strong and the weak powers of his mind, the traits of his character, and his likes and dislikes: and all this provided he does not exceed the *limit* or mar the *form* referred to above. While he is thus living his individual life and his personality is asserting and revealing itself he is being carefully observed by the educator so that she may be enabled to give wisely on occasion that help which is education as far as she is concerned. But the education which is alone of vital value is auto-education: " Each one of them perfects himself through his own powers and goes forward guided by that inner force which dis-

[29] *The Montessori Method*, p. 104

tinguishes him as an individual."[30] A sixth principle—that education must be through the senses, can be more conveniently considered in the section following.

There are many points in connexion with Dr. Montessori's principles and her own exposition of them which invite critical consideration. Such criticism, however, to be just and of value, would involve a discussion too full for inclusion within the limits of this chapter. Nor would it, indeed, be germane to our purpose here which is, as we have indicated, to give in broad outline an account of her principles and practice with a view to establishing their relationship to those of her inspirers. The next chapter will be devoted to criticism.

We have already considered her generous acknowledgment of the general inspiration and guidance she received from Itard and Séguin. In the tenth chapter of *The Montessori Method* she devotes several pages to an account of the former's great achievement in the education of the Savage of Aveyron, and points out that when he came to realise the idiocy of his pupil, "his philosophical theories gave place to the most admirable, tentative, experimental pedagogy." As she herself did a century later, Itard observed and experimented, prepared an environment, allowed all the freedom that was possible in the case of such a wild

[30] *Ibid*, p. 374.

creature, and spent *whole hours* in close watching for the spontaneous manifestations of his pupil, more especially as they were operative in the freedom of the garden, during Nature's more active and expressive moments of storm, or when left at liberty in his room or at the Observatory. In the nature of the case, of course, his whole attention was devoted to an *individual,* whom he studied from all points of view in a manner most thorough and detailed. "To this child," she says, " are due the first steps of positive pedagogy." His fears, perplexities, pains, pleasures; his looks, grimaces, gestures; his likes and dislikes; his needs, and his defects of all kinds were studied with almost incredible patience. " Here is a sample of the admirably patient work of Itard as *observer of the spontaneous expressions* of his pupil: it can most truly give teachers, who are to prepare for the experimental method, an idea of the patience and the self-abnegation necessary in dealing with a phenomenon which is to be observed": and she quotes at length Itard's account of his observations with which we dealt fully in our second chapter. She concludes her account of his work in these terms: " In the education of little children Itard's educative drama is repeated: we must prepare man, who is one among the living creatures and therefore belongs to nature, for social life, because social life, being his own peculiar work, must also

correspond to the manifestation of his natural activity."[31] In Itard's poignant and eloquent pages she found very clearly implied, often, indeed, expressed, the great fundamental principles of her own educational system.

It will be clear from the detailed account in the previous chapter of Séguin's thought and practice that Dr. Montessori must have found during her long and close study of his work both inspiration and guidance in regard to her six fundamental principles. It must be remembered, however, that all Séguin's practical educational work was concerned with idiots, that he had to begin with " the rather immovable or ungovernable mass called an idiot," a mass with which it was impossible to associate the ideas of spontaneity, freedom, and individuality in the large sense in which we have hitherto discussed them. And yet these three great ideas animated all his magnificent work! They were, in truth, *ideals* to the realisation of which all his best educative efforts were patiently directed, being in some cases sustained for several years. To render his poor idiot pupils capable of spontaneous manifestations and activities, to enable them to appreciate and make use of their physical, mental and moral freedom, and to *create*, we must almost say, or to deliver from its bondage and develop the feeble individuality of each idiot child

[31] *The Montessori Method*, p. 153

—these were among the great objects he ever sought to achieve. He endeavoured always to elevate his idiot pupils towards the high level of the normal child, of whom he thought as living his individual life spontaneously and freely. And always he aimed at developing in them the power of spontaneously desiring, choosing, and acting; at producing in them "the echoing spontaneity which is the completely free man"; of restoring to them, "in spontaneous will, the synergic faculty of the race." We have already quoted a passage[32] in which he expressly states that individuality must be secured, and that the first test of fitness in a teacher is respect for the individuality of the pupil. A close study of his educational views and aims makes it abundantly clear that had he had the opportunity of educating normal children he would, like his great follower, have included these three principles among the fundamentals of his system. Dr. Montessori found in his pages expressions of reverence for the spontaneous manifestations of normal childhood. He strongly condemned their suppression, the denial of liberty to the child, all oppression, and the setting up of "fatal antagonisms." He would, indeed, allow greater freedom for spontaneous activity than she would. Thus he writes: "One of the earliest and most fatal antagonisms taught to a child is the forbidding

[32] Chapter III., p. 146.

of using his hands to ascertain the qualities of surrounding objects, of which his sight gives him but an imperfect notion, if it be not aided by the touch; and of breaking many things as well, to acquire the proper idea of solidity. The imbecility of parents in these matters has too often favoured the growth of the evil spirit. The youngest child, when he begins to totter on his arched legs, goes about, touching, handling, breaking everything. It is our duty to foster and direct that beautiful curiosity, to make it the regular channel for the acquisition of correct perceptions and tactile accuracy; as for breaking, it must be turned into the desire of preservation and the power of holding with the will; nothing is so simple, as the following example will demonstrate" :—[33]

He goes on to relate the story of a very excitable child, eighteen months old, "touching, breaking, throwing everything he could," whom he allowed to throw away and break unmatched Bohemian glasses and *Sèvres* cups. The child was not prevented from thus acting spontaneously; his freedom was not interfered with; no anger was turned upon him—"only the composure and accent of pity for the child who could willingly incur such a loss." Later this baby spontaneously developed the power of taking care of still finer cups and glasses: he taught his little fingers how to embrace with security

[33] *Idiocy, etc.*, p. 143.

the thin neck of one, the large body, or the diminutive handle of others. " In practising these so varied handlings, his mind became saving and his hands a model of accuracy."

As to Séguin's position in regard to the two remaining Montessori principles, which insist upon a scientific system and a prepared environment, little need be said. His whole system was soundly based on science. And his observation and experiments had definite reference to each individual child. Every pupil was examined with most minute care, and throughout his education his special needs received the most delicate observation and attention. Science determined every observation, experiment, and mode of treatment. Séguin brought to his work a first-class mind, highly trained in the general principles and methods of science, and possessing a profound knowledge of the physiology and psychology of his time. He had, as we have seen, made a long and careful study of Pereira's work, which also had a definite scientific basis, and which, indeed, revealed to him the marvellous potentialities of the human organism. As a student under Itard and a diligent and eager reader of the latter's two educational pamphlets, he was, of course, impressed by the value of the detailed scientific study of the individual to be educated. Our study of his methods in the previous chapter has shown how elaborately he prepared the environment and how

scientifically he adapted it to the needs of each pupil. His room of silence and darkness, with its many kaleidoscopic and other contrivances, and his skilfully arranged floor may be referred to again as illustrating his realisation of the value of this principle. He refers to his prepared environment as being *artificial,* while Dr. Montessori speaks of hers as being *natural:* but there is no difference in their points of view. Both advocate the preparation to suit the nature and needs of the child, and he calls his artificial for the literal reason that it is arranged by human agency.

MUSCULAR AND SENSE TRAINING.

The influence of Séguin is plainly seen in the importance which Dr. Montessori attaches to the training of the muscles, as well as in the nature of the apparatus and methods she uses for this purpose. But she apparently fails to appreciate, as he so clearly did, the great psychical significance of muscular development. He realised that the education of the muscles had a definite effect on that of the intellect. He also perceived clearly the close connexion between the muscular and sensorial systems and the influence which the educational development of one of them had upon that of the other. For her, on the other hand, the training of the muscles has merely physiological

significance, and she appears to regard the muscle and sense systems as being mutually independent in work and development. It is possible that she has understood Séguin's emphasis on these interrelations and influences as having its full significance in regard only to " the immovable or ungovernable mass" of an idiot. She thus states her very narrow view of the education of the muscles : " We must understand by *gymnastics* and in general by muscular education a series of exercises tending to *aid* the normal development of physiological movements (such as walking, breathing, speech), to protect this development, when the child shows himself backward or abnormal in any way, and to encourage in the children those movements which are useful in achievement of the most ordinary acts of life ; such as dressing, undressing, buttoning their clothes and lacing their shoes, carrying such objects as balls, cubes, etc."[34] Throughout the chapter she devotes to this subject there is no reference to mental or moral effects. She treats in some detail of the physical proportions, morphological differences, and bodily defects to be considered, but nowhere escapes from the physiological level. She has forgotten or failed to appreciate Séguin's conception of the unity of the educable organism.

For the physiological development of the child through muscular training she makes use of special

[34] *The Montessori Method,* p. 138.

apparatus, partly chosen from Séguin's sets and partly invented by herself. The principle determining its selection, invention, and employment is that it must provide exercises corresponding to those bodily movements which the child *needs to make* in order to develop, and must allow him a proper outlet for his individual activities. In this connexion she learned much through closely observing the children's tendencies and habits. Thus she noticed that some of the pupils engaged in marching exercises occasionally left the ranks through fatigue; but instead of resting on the ground or available seats they climbed on to a wire fence and pulled themselves sideways along the wires. They had found a way of enjoying considerable movement without throwing their whole weight on to their legs, and thus had solved one of the observer's problems. The wire fence, which she recommends for general use, was adapted for indoor use, wooden bars being substituted for the wires. Among other pieces of apparatus she includes Séguin's ingenious swing or "trampolino," rubber balls attached to a cord and used in a game called "The Pendulum," a little wooden spiral staircase, a low wooden platform, with painted lines, used for long jumping, and rope ladders. The movements involved in the child's use of all these contrivances are useful, she claims, because they

help him to acquire first of all equilibrium and then the muscular co-ordination which is necessary to him.

Dr. Montessori also makes use of free gymnastics for which no apparatus is required. These exercises are of two kinds: prescribed, such as marching; and free games with balls, hoops, bean bags, or kites. In the prescribed class she also includes many of Froebel's games which are accompanied by songs. The object of the marching is poise only, and not rhythm. Dr. Boyd's short criticism[35] of this exclusion of rhythm may seem to imply that Dr. Montessori always excludes it. She does not, however; it receives due consideration in her musical exercises, and special marching in which the chief object is rhythm is often practised.[36] Her point here is apparently that in marching intended for muscular development poise is more important than rhythm. Here the march should be accompanied by the singing of little songs, "because this furnishes a breathing exercise very helpful in strengthening the lungs." She also uses exercises which she calls "respiratory gymnastics." Their purpose is to regulate the respiratory movements, "to teach the art of breathing." Allied to them

[35] *From Locke to Montessori*, p. 157.

[36] Vide *The Montessori Method*, pp. 207, 208 and 342. On page 208 she clearly expresses her appreciation of the educational value of rhythm. A whole chapter of *The Advanced Montessori Method* is devoted to this subject—Chapter IV., Vol. II.

are exercises to encourage the formation of correct speech habits. In these the correct use of lips, tongue and teeth is carefully practised. Every effort is made to secure good articulation, the pupils being tested and helped individually and all defects and difficulties being carefully noted by the directress.

The greater part of Dr. Montessori's practice is concerned with the education of the senses, and it is for this special purpose that almost all her didactic material has primarily been selected or invented. She thus states the object of this part of her work : " The education of the senses has, as its aim, the refinement of the differential perception of stimuli by means of repeated exercises."[37] A careful study of her three chapters on sense training will reveal the fact that she realises that it has higher aims than this. Towards the close of the third of these chapters she takes a higher view. She declares that from the physiological point of view, the importance of the education of the senses is evident from an observation of the scheme of the diagrammatic arc which represents the functions of the nervous system. The external stimulus acts upon the organ of sense, and the impression is transmitted along the centripetal way to the nerve centre ; the corresponding motor impulse is elaborated, and is transmitted along the centrifrugal path to the organ

[37] *The Montessori Method*, p. 173.

of motion, provoking a movement. She shows that although the arc represents diagrammatically the mechanism of reflex spinal actions, it may still be considered as a fundamental key explaining the phenomena of the more complex nervous mechanisms. Man, by means of his peripheral sensory system, gathers various stimuli from his environment, putting himself thus in direct communication with his surroundings. "The psychic life develops, therefore, in relation to the system of nerve centres; and human activity, which is eminently social activity, manifests itself through acts of the individual—manual work, writing, spoken language, etc.—by means of the psychomotor organs."[38] References to the nervous system in her writings are few.

In this chapter she affirms very definitely too that "All education of little children must be governed by this principle—to help the natural *psychic* and *physical development* of the child"[39]; and although she does not elaborate the theme it is evident that she sees in the training of the senses the best means of intellectual, moral, and æsthetic development. For her the aim of education in general is twofold, biological and social. From the point of view of the first we must help the natural

[38] *The Montessori Method,* pp. 222 and 223. On the former page there is a simple diagram illustrating centripetal and centrifugal transmission.

[39] *Ibid,* p. 216.

development of the individual, while from that of the second we must prepare him for his environment. For both these purposes the training of the senses is of the greatest importance. Biologically considered, it must precede all superior intellectual development, and it should therefore receive our closest attention and be our chief care during the formative period of childhood—from three to seven. This is the period during which adapted and graduated sense stimuli produce their greatest developmental effects. Socially viewed, the training of the senses enables the pupil to enter more effectively into relations with his environment. His perceptive powers will become more exact and discriminating in their operations and he will thus be more efficient in his life's work. The child so trained will be a better cook or a more skilful physician than would otherwise be possible. Critics have said that there is necessarily involved in all this the idea of formal training. This idea is not discussed by Dr. Montessori, but unconsciously she supplies an answer to such critics when she assumes that the result of sense training is the establishment of physiological habits ; and these may, without any question arising as to the possible transfer of sensory capacity, have influence in most numerous and varied relations of life.

The education of the senses is necessarily auto-education. A teacher cannot give a child sensory

powers any more than she can give him gymnastic agility. This is true, indeed, of all education, but is strikingly so in the case of the senses. It is true also that much more help can be given in some parts of intellectual education, by a process of clear arrangement or simplification, for example : but for his sensory education the child himself must do everything. Unless he sees, touches, hears, tastes and smells, sense education is impossible for him. The only work for the teacher here is to induce the pupil to use the material necessary for his self-education, and to observe and record his progress or retardation.

A very important point in Dr. Montessori's technique is the isolation of the particular sense being educated. In the case of every sense except sight the child is blindfolded. Here again she is following Itard and Séguin. She finds that normal children greatly enjoy and are deeply interested in the tests and exercises for which they are blindfolded. Freed from the innumerable distractions of sight they take part in various exercises of great value in the training of the other senses. Thus after a solemn silence has been secured they have to listen for the gentle whisper of their names at varying distances. Or they have games in which they have to recognise various weights or distinguish various materials by touch. In another important particular of her technique she also follows Itard

and Séguin. This is her use of wide differences and strong contrasts in the objects or qualities presented to the senses. Thus the longest and the shortest rods are presented together, or the thinnest and thickest: in colours, blue and red are shown. Gradually the differences are lessened until the most delicately differing tints or the slightest differences in length or thickness can be distinguished. The principle is to proceed from few stimuli strongly contrasting to many stimuli in gradual differentiation, always more fine and imperceptible.

In all this work the primary aim is "sensory culture": that must come first. But though not directly aimed at, knowledge will also come. Both concrete and abstract ideas will be acquired through the spontaneous development of the senses. In due course will come, too, the desire and the ability to express knowledge and thought in language. Here the teacher's function as helper comes into play; and the method she is to use is once again inspired by Séguin. "However desirable it may be to furnish a sense education as a basis for intellectual ideas, it is nevertheless advisable at the same time to associate the *language* with these *perceptions*. In this connection I have found excellent for use with normal children the *three periods* of which the lesson according to Séguin consists: *First Period.*—The association of the sensory per-

ception with the name. For example, we present to the child two colours, red and blue. Presenting the red, we say simply, ' This is red,' and presenting the blue, ' This is blue.' Then, we lay the spools upon the table under the eyes of the child. *Second Period.*—Recognition of the object corresponding to the name. We say to the child, 'Give me the red,' and then, 'Give me the blue.' *Third Period.*—The remembering of the name corresponding to the object. We ask the child, showing him the object, ' What is this?' and he should respond, ' Red.' Séguin insists strongly upon these three periods and urges that the colours be left for several instants under the eyes of the child. He also advises us never to present the colours singly, but always two at a time, since the contrast helps the chromatic memory."[40] She says she has proved that there is no better method of teaching deficients; but points out that for normal children there is a period preceding those of Séguin, and that it is then that true sense education takes place. This is the period in which the child acquires "a fineness of differential perception, which can be obtained *only* through *auto-education.*" To Itard, " this pioneer in pedagogy," as she names him, she also acknowledges her indebtedness in this matter of associating perceptions and language. She quotes *in extenso* three sections from his second Report on

[40] *The Montessori Method*, pp. 178 and 179.

the education of the Savage of Aveyron, and her concluding comment is: "Here also is demonstrated the great educative superiority of scientific pedagogy for normal children."

Sensory auto-education "leads to a perfecting of the child's psychosensory processes" and so achieves intellectual development. Dr. Montessori heads her short chapter on intellectual education with a quotation expressing Séguin's aim—"To lead the child from the education of the senses to ideas." And this is one of her own ultimate aims. The great means is the concentration of attention during such lessons after Séguin as that briefly outlined above and others more advanced. Just as the sense to be trained is isolated, and with it the pupil's objective attention, so must the "inner attention" be isolated on occasion by the process of concentration. The way leads from sensations to ideas—first concrete, then abstract—on to association of ideas. "The movement, or the *spontaneous psychic activity* starts in our case from the education of the senses and is maintained by the observing intelligence." She claims that moral and æsthetic education is closely related to sensory education; that as we multiply the sensations and develop the capacity of appreciating delicate differences in stimuli we refine the sensibility, and increase the number while elevating the nature of man's pleasures. To the man with coarse senses the

essential harmonies of nature and life do not appeal : the world to him is narrow and barren. Only the strongest stimuli, which seldom have moral sources or outlets, are perceived by such a man. Thus his pleasures are necessarily gross and his moral nature remains crude.

THE TEACHING OF WRITING AND READING.

Though Dr. Montessori expresses no keen appreciation of the fact, the finer muscular powers are trained and developed during the process of sensory education. Their development, together with that of the senses, facilitates the acquisition of the art of writing, which is taught before reading. Writing and reading found no place in her original scheme for the work of the Children's Houses. But the sense training developed her pupils intellectually in such a surprising way that it soon appeared necessary to provide some definite *conclusion* of the exercises. A number of the children went to her and " frankly demanded to be taught to read and write" ; and their parents also requested that she should undertake this work. She had, as we have seen above, already succeeded in teaching defectives to read and write, and found no difficulty in adapting her method to the teaching of normal pupils. Moreover, her experience with one idiot girl of eleven led her to the discovery of a most important

principle. This girl, though possessed of normal strength and motor power in her hands, could not learn to sew, or even to darn. She was set to practising weaving with the familiar Froebel mats in which strips of paper are threaded transversely in and out among vertical strips. The movements required for this being similar to those for darning and sewing, but on a larger scale, practice in them *prepared* for the latter, and when the girl was brought back to darning it was found that her difficulties had vanished. "I saw," says Dr. Montessori, "that the necessary movements of the hand in sewing *had been prepared without having the child sew*, and that we should really find the way to *teach* the child *how*, before *making him execute* a task. I saw especially that preparatory movements could be carried on, and reduced to a mechanism, by means of repeated exercises not in the work itself but in that which prepares for it. Pupils could then come to the real work, able to perform it without ever having directly set their hands to it before."[41]

Her normal pupils had already had much experience in touching the contours of her geometric insets and it was easy to extend this to the forms of script letters. The letters were cut in sandpaper, 8 cm. high and $\frac{1}{2}$ cm. broad, and glued on

[41] *The Montessori Method*, p. 263.

cardboard. The children pass their fingers over these letters, guided by the roughness, and practise the larger movements required in writing. But it is also necessary to prepare for the use of pen or pencil, which involves a different set of muscular movements. This is done by getting the child to trace designs of the geometric insets and fill in the space by drawing lines with coloured pencils. Progress in this exercise is rapid, the short and indefinite lines soon giving place to longer lines nearly parallel, and these in their turn being replaced by quite regular strokes. Exercises are next introduced which aim at associating the visual and muscular—tactile sensations with the sound of letters. Two of the sandpaper letters are given to the pupil and he is told their names. He is shown, if necessary, the direction in which to trace them and is then allowed to pass his index finger over them repeatedly. He finds pleasure in doing this with his eyes closed. Lessons based on Séguin's three periods then help to associate definitely the sounds of the letters with the sensations of sight, touch and muscles. At the conclusion of such a lesson the child should be able to answer correctly the question, " What is this ?" In teaching the consonants only the *sounds* are given and they are united with vowels at once. It is not necessary to teach all the vowels before beginning with consonants. In addition to the cards

containing single letters, larger cards are used, each containing several letters grouped according to contrasted or analogous forms.

By learning each consonant in association with vowels the child, has, of course, learned syllables, and when he knows a few letters of each kind he is ready for exercises in the composition of words. He is now provided with a box containing four copies of the alphabet, the letters being of the same form and size as those already used, but cut out of cardboard and not mounted : they can thus be more usefully handled and more easily placed together. The box contains a special compartment for the four copies of each letter, so that the pupil can readily find those he requires. It is his duty to replace them correctly at the end of the lesson. The directress pronounces very clearly, several times, such a word as *mama,* emphasising the *m* sound. Almost always the child, with an impulsive movement, seizes the *m* and lays it on the table. *Ma-ma* is then repeated, and the child places an *a* near the *m:* and similarly for the second syllable. He has composed a word, but there remains the greater difficulty of reading it. The directress sits beside him " urging him to read, and reading the word with him once or twice, always pronouncing very distinctly." Her function as helper is here very strongly operative. Soon the child triumphs over this difficulty, other words are taught similarly

and progress is rapid. The importance of these exercises, Dr. Montessori points out, is very complex. The child analyses, perfects, fixes his own spoken language, placing an object in correspondence to every sound which he utters. The composition of the word furnishes him with substantial proof of the necessity for clear and forceful enunciation. The exercise, thus followed, associates the sound which is heard with the graphic sign which represents it, and lays a most solid foundation for accurate and perfect spelling.[42] As soon as one word is learned the letters used are returned by the child to their respective compartments. Dr. Montessori points out that each lesson supplies three sets of exercises which help to fix the desired associations: first, there are those of the comparison and selection of the required letters, secondly those during which the words is composed, and thirdly those involved in correctly replacing the letters in their compartments. In all this the intellectual powers are clearly being developed. The child *thinks* about the problems involved, and though helped a good deal his spontaneity is not interfered with unduly. One day a little boy of four was found running about on the terrace saying repeatedly, "To make Zaira, I must have z-a-i-r-a."

[42] *The Montessori Method*, pp. 283 and 284. It will be remembered that the Italian language is almost purely phonetic.

So far the child has not written, though he has learned the two sets of movements necessary—those actually involved in forming the letters and those required in the manipulation of the pen or pencil. Usually no effort is made, or is necessary, to induce him to write. The average child will " come into his full power by way of a spontaneous explosion into writing." Indeed, it is often necessary to arrange judiciously that this "explosion" shall not be too violent: and Dr. Montessori gives some guiding hints in regard to this important matter. She writes very eloquently of the children's glowing joy in their new-found powers. After the first spontaneous burst their progress is very rapid and they can very soon write all the words they know. Some of her pupils have learned to write their first words at the early age of three-and-a-half years. The period that elapses between the first preparatory exercises and the writing of the first word ranges for the average child of four, from four to six weeks; and for the child of five it is shorter. The form of the writing is beautifully round and flowing, resembling very closely the carefully made cardboard script letters with which they performed their preparatory exercises.

The child, as we have seen, pronounces or " reads" the word he composes. This process must not, however, be confused with reading proper. In the first case he is simply *verifying*

the word he has formed, is translating signs into sounds as he had previously translated sounds into signs. Reading proper is "the interpretation of an idea from the written signs." The child first *reads* in the true sense when, not having heard a word pronounced, he recognises it when formed from the cardboard letters, pronounces it, and knows its meaning. He must recognise the word as a whole and associate it with what it represents. "The intervention of a superior work of the intellect is necessary if he is to read": and hence she claims that reading must be taught after writing. Moreover, it is clear that the method of teaching writing greatly facilitates the task of learning to read. For the teaching of reading in the proper sense of the term Dr. Montessori writes in large clear script on cards or slips of writing paper some well-known words which have been frequently pronounced by the children. Usually they are names of toys or other objects in the room. At first the object is placed near the child to help his interpretation of the word to be read. No question arises as to the difficulty of the words first used, as the child has learned through his composition of words to name the sounds composing all those of ordinary difficulty. One word is presented to the pupil who slowly names its component sounds. If all are correctly named he is urged to pronounce them more rapidly, and still more rapidly, until in his phonetic language he

finds himself pronouncing the whole word, and its meaning bursts upon his consciousness : he assumes an air of great satisfaction as if he had recognised a friend. He then places the card bearing the word under the object whose name it is, and the lesson is finished. Numerous words are learned in this way in a surprisingly short time. Later they play a most interesting game. The names of the many toys are written on cards which are folded and placed in a basket. The pupils then select folded cards in turn and take them to their seats where they read them mentally. Then each goes to the directress in turn, presents his card, pronounces the name upon it, and if correct he is allowed to have the corresponding toy to play with as long as he pleases. After a time, however, Dr. Montessori's pupils refused to accept the toys, preferring to continue the choosing and reading of the folded cards ! Their desire for knowledge of words was amazing. So the toys were put away and *hundreds* of written slips containing names of persons, places, things, colours and qualities were placed in open boxes from which the children could take them when they wished. No mere childish inconstancy was displayed here : each child read right through the contents of a box before proceeding to another. Later she was about to teach them to read ordinary print, but they had forestalled her ! They had learned to read both plain and Gothic print on a wall

calendar. Friends who had noted the children's ability to read print presented them with beautifully illustrated books containing simple fairy stories. But although they could read them they did not understand them, as Dr. Montessori proved by tests. She stopped the reading from books and waited until the real meaning of words, of language, of composition came spontaneously. One day four children rose at the same time and joyously wrote phrases on the blackboard expressing their gladness that the garden had begun to bloom. She then realised it was time to begin the reading of phrases. Following the clue afforded by the four pupils, she wrote on the blackboard, " Do you love me ?" The children read it aloud slowly, remained silent a moment as if thinking, and then cried out, " Yes ! Yes !" Many other phrases and sentences were written on the board and were all understood. Later she wrote somewhat long directions on cards and handed them to the pupils, who were soon able to understand and carry out the orders. In this way intelligent reading was taught in a remarkably short time.

In the first of her two chapters on the teaching of writing and reading Dr. Montessori discusses at considerable length the theory and practice of Itard and Séguin. Her adverse criticism of the latter's ideas is based on the account of his work given in his earlier book written in 1846. Through mis-

understanding or carelessness she misrepresents him in at least one essential matter. "We have Séguin," she says, "teaching geometry in order to teach a child to write, and making the child's mind exert itself to follow geometrical abstractions only to come down to the simple effort of drawing a printed *D.*"[43] Here she is quite wrong. Séguin did not teach geometry or devote any attention to its abstractions before the formation of letters *evolved.* He taught *form,* which he analysed into certain basic types, among these being circles, squares, triangles, and other geometrical figures. He taught his idiots to *draw* these forms. Later he taught them to draw various combinations of straight and curved lines, and from this the *drawing* of letters was evolved, and hence writing. He came no nearer to teaching geometry for this purpose than does Dr. Montessori, whose pupils have considerable practice in touching and placing geometrical insets before they proceed to learn writing.

Aided by her long scientific observation and teaching of normal children, she has, in regard alike to principle and technique, progressed considerably beyond the position reached by the great pioneer who inspired her. But there are some matters of both theory and practice in regard to which her indebtedness to him is obvious. Her important

[43] *The Montessori Method,* p. 256.

principle of preparing for writing or other work "by means of repeated exercises not in the work itself" was also Séguin's principle. According to him, before we begin the teaching of drawing and writing "we have given to their hands the firmness and the precision necessary to draw and to write."[44] Again he says, "Contrarily to school practice, and agreeably to nature, our letters are to be written before being read."[45] Almost an echo is her "Contrary to the usually accepted idea, writing precedes reading."[46] Séguin used letters cut out of cardboard as she does, and "small cards, bearers of a single syllable or word; the large cards showing whole series of the same," for reading. Like her, he grouped letters according to contrasts and analogies and taught reading by whole words. Finally her method of associating sounds with visual, tactile and muscular sensations is admittedly based upon his.

THE DIDACTIC APPARATUS.

The Montessori didactic apparatus, which provides for the training of all the senses except taste and smell,[47] consists of twenty-six sets varying considerably in purpose and construction. She began

[44] *Idiocy*, etc., p. 121.
[45] *Ibid*, p. 123.
[46] *The Montessori Method*, p. 296.
[47] With regard to these two senses she says: "This phase of sense education is most difficult, and I have not as yet had any satisfactory results to record." *Op. cit.*, p. 190.

her work in the Children's Houses by allowing the pupils to practise "contemporaneously with the most varied exercises": but experience showed that there were five grades or stages for the proper presentation of the material. In all these grades training, apart from the special apparatus, is given through "exercises of practical life." In the first grade this consists in teaching the child to move little chairs silently. Two sets of the apparatus are found especially suitable at this stage. The first consists of ten frames to each of which are attached two pieces of cloth or leather which can be fastened down the middle by means of buttons, hooks, laces, ribbons, or automatic fasteners. By the use of these the child develops muscular power and learns the movements necessary for dressing and undressing. The second set used now consists of three solid blocks of wood, each containing ten wooden cylinders fitting exactly into holes in the block, and provided with brass or wooden tops for holding with the fingers. Each piece resembles a chemist's set of weights. In the first block the cylinders are all of equal height but differ in diameter; in the second the diameters are equal while the heights vary; in the third both height and diameter vary. The child takes all the cylinders out of the block, scatters them on the table, and then replaces them. The blocks are not all of the same difficulty and should be used in the above order unless a child

clearly desires to use them in another order. By playing with these insets the pupil acquires experience of size and learns to distinguish objects according to height and thickness. All errors are revealed by the apparatus.

In the second grade the exercises in practical life include rising and being seated in silence and walking on a chalk line. The special apparatus consists of the set of cubes, the Big or Broad Stair and the Long Stair. There are ten rose-coloured cubes varying from 10 cm. to 1 cm. side, and the child has to build these regularly into a tower, beginning with the largest. Here he has to distinguish larger and smaller objects as they lie about at different distances. The Big Stair is built up by the child with ten rectangular prisms, 20 cm. long and with bases ranging from 10 cm. to 1 cm. This exercise teaches him to distinguish thickness and thinness. The Long Stair is constructed with ten rectangular rods, each 3 cm. thick, varying in length from a metre to a decimetre. The decimetre lengths on all rods are painted alternately red and blue. Beginning with the longest, and arranging corresponding colours together, the rods have to be built up to make a stair. This difficult exercise leads to an appreciation of length and is also of use in teaching arithmetic. In these exercises more difficult movements and greater muscular effort are involved; and as the apparatus does not so readily indicate errors

the eye has to do more work than in the first grade. At this stage the child is capable of fixing his attention upon and of being interested in the tactile and thermic stimuli. Dr. Montessori is fully aware that biologically touch precedes sight, but she found that tactile stimuli did not *attract attention* as early as the visual. She therefore does not present the former until the education of attention begins. Training the thermic sense makes touch more acute. The hands are placed in basins of water of widely differing temperatures, thus using the principle of contrast. Later the differences of temperature are graded, a set of bowls being used. There follows practice in the correct method of touching surfaces with the finger tips, and materials of many kinds are used. In all the touch exercises the eyes are closed. Two pieces of special apparatus are also used; one being a rectangular board half of which is polished or covered with smooth paper and half covered with sandpaper. At this period also a beginning is made in the training of the colour sense. Sometimes pieces of stuff or wool balls are used for this purpose; but formal didactic material has been arranged, consisting of sixty-four tablets wound with wool or silk, and having raised ends to keep the coloured stuff off the table. The children are taught to handle the tablets at the ends only. There are eight gradations of tint for each of the eight colours, black (ranging through greys to white),

red, orange, yellow, green, blue, violet and brown. A beginning is made by the child arranging strongly contrasting colours like red, blue, and yellow in corresponding pairs, Itard's and Séguin's principle of proceeding from wide to narrow differences being followed. The contrasts gradually become less striking as more colours and shades are introduced, until at last the child can distinguish delicate differences. Later he learns to grade the tints of all the colours and acquires the power of going some distance to obtain a tablet of corresponding shade to one shown him.

In the third grade the lessons in practical life enable the children to wash, dress and undress themselves, dust tables and handle various objects. They are also exercised in the discrimination of more delicate gradations in the stimuli already experienced, their spontaneity being allowed free play. Stimuli for the sense of hearing and for the baric sense are now presented. In the training of the former sense the principle of spontaneity cannot be relied upon: the teacher has to do a great deal for the children. As in Séguin's practice, the first essential here is the securing of silence and immobility before the lessons begin. Exercises are then arranged to enable the pupils to distinguish *noise* from *sound* and to discern the differences among noises and among sounds. For the former small boxes containing pebbles, sand, and other

substances are used, the boxes being shaken and differences distinguished: for the latter Pizzoli's series of little whistles can be used. A double series of thirteen bells gave no valuable results, as the children could not strike the corresponding bells with equal force. "I believe," confesses Dr. Montessori, "that the best results can be obtained with the primitive means employed by Itard in 1805. He used the drum and the bell."[48] Here again the principle of progress from wide to narrow differences rules. The apparatus for the training of the sense of weight consists of three tablets of the same size made of wistaria, walnut, and pine, and weighing 24, 18 and 12 grammes respectively. They are perfectly smooth so as to produce no distraction through touch. The child places one in each palm at the base of the fingers, and moving his hands gently up and down while the eyes are closed, decides which is heavier: the third is similarly compared with the lighter. After a time the up-and-down movement of the hand should become hardly noticeable. There follows the training of the stereognostic sense which "leads to the recognition of objects through feeling, that is through the simultaneous help of the tactile and muscular sense." For this Froebel's bricks and cubes are first used. By handling without the aid of sight the pupil has to arrange the cubes on one side and the bricks on

[48] *The Montessori Method*, p. 205.

the other. Various other objects, including toys, balls and coins are used later. During this stage the child is being trained to appreciate form, and for this purpose the apparatus is elaborate. It consists of a large number of geometrical shapes which can be fitted exactly into corresponding slots or spaces. " The idea of these insets goes back to Itard and was also applied by Séguin."[49] These insets are contained in frames which are kept in rectangular trays. They are taken from their frames and scattered on a table. They are carefully examined by sight, touch and muscular sense, and then have to be placed correctly in their frames. The pupil passes his index finger along the edges of the contrasting shapes and their spaces, and thus visual, tactual and muscular impressions are associated. Later three sets of cards are used : on the first are pasted geometrical figures in blue paper corresponding exactly with the insets ; on the second are outlines of the same figures in blue paper a centimetre wide ; on the third their outlines in thin lines. The child has to learn to recognise the correspondence between these three sets of figures and the insets and to prove his having done so by placing an inset over each figure correctly. Thus he gradually becomes able to recognise the representation of form by simple lines.

49 *Ibid*, p. 106.

In the fourth grade the children learn to perform various domestic duties and to attend to the more minute details of personal toilet. Through rhythmic exercises they learn to walk with perfect freedom and balance, and they practise spontaneously all the exercises referred to above. Prominence is given to music at this stage, both voice and instruments being used to teach them to distinguish notes. The bells already referred to are used here, but Dr. Montessori believes that " simple and primitive instruments are the ones best adapted to the awakening of music in the soul of the little child," and she notes the valuable " educational disciplinary effect" of rhythmical tunes. It is at this period as a rule that the child practises tracing and filling in with pencil the geometrical outlines preparatory to writing, and that he learns to recognise the sandpaper letters by touch. Now also he learns to count the pieces of apparatus and to arrange the insets to make interesting designs. Séguin's plan is here used for associating numbers with figures by placing the correct number of coloured counters under the figures on the table.

In the fifth and last stage of the child's stay in a Montessori school he continues spontaneously all the foregoing exercises, many of which may be made more complex as he grows in proficiency. The various rhythmic exercises increase considerably in complexity. In design he is introduced to the use

of water colours, and free drawing from nature is also practised. During this stage he progresses in writing, reading and simple arithmetic. "The children at this stage present most interesting differences of development. They fairly *run* towards instruction, and order their *intellectual growth* in a way that is remarkable." It must be noted that these five grades or stages represent no definite divisions of time, nor do they involve any classification of the children. It is simply an observed fact that as a rule the child in relation to the didactic materials passes through such stages.

When Dr. Montessori began her educational work with idiots she made use of much of the apparatus described by Itard and Séguin, while most of that she devised herself was based on theirs. "Guided by the work of these two men, I had manufactured a great variety of didactic material,"[50] she writes; and later, "This belief that we must act upon the spirit served as a sort of *secret key*, opening to me the long series of didactic experiments so wonderfully analysed by Edward Séguin."[51] When, however, she commenced to teach normal children she found that modifications and extensions were necessary, and she began to think about the principles which should determine these. As often in her career, her close and sympathetic observation

[50] *The Montessori Method*, p. 36.
[51] *Ibid*, p. 37.

of children led her to the discovery of such important principles. She observed that they became so completely absorbed in their spontaneous exercises with certain pieces of apparatus that they did not notice very deliberate attempts—made as experiments—to distract their attention. They continued to repeat the exercises as often as forty times. This did not happen with other apparatus, some of which, indeed, was not often spontaneously used. This polarisation of attention and repetition of the exercise obviously offered means of judging the value of didactic material. On this principle Dr. Montessori discarded several items (which are now kept in a museum cupboard), modified others, and added new pieces that could pass the great test. A valuable secondary principle is closely allied to the first: the polarisation and repetition do not as a rule take place unless the didactic apparatus controls errors: unless it either automatically reveals the child's errors, as in the case of the cylindrical solid insets and the geometrical forms; or by its exact and symmetrical completed structure helps the eye to perceive mistakes, as in the case of the tower of cubes. Through prolonged and close study and observation, guided by these principles, she has gradually organised her "prepared environment" in harmony with the spontaneous manifestations of childhood. She believes that still more suitable apparatus will be evolved in time

through the use of more detailed experiment than her own. Of the latter she says: "This long, occult experiment—suggested to me, as I have already said, by Itard and Séguin—is, in fact, my initial contribution to education. All this preparatory work has served for the determination of the method now well known, but it is also the key to its continuation."[52] Educators will await with interest the results of this continuation, more especially in its application to the education of older children.

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In all that has been said in the foregoing pages in regard to the inspiration and guidance which Dr. Montessori has received from Itard and Séguin there has been no intention of detracting from the value of her original contribution to the theory and practice of education. It is a very great contribution. It has attracted the attention of educators in all parts of the world, bringing a challenge to some, an incentive to others, inspiration to many and suggestion to all. Experience and experiment may later prove that much of her work, as of that of all other pioneers of education, possesses only transitory significance. But it may well be that her fundamental principles will stand the tests of all time.

52 *The Advanced Montessori Method,* p. 81.

CHAPTER V.

CRITICAL CONSIDERATIONS.

ALTHOUGH in the course of our study it has occasionally been necessary to consider the Montessori Method from a critical standpoint, the foregoing chapters are in the main historical and expository. Having briefly recorded the history of the Method, revealed the chief sources of its founder's inspiration, and broadly reviewed its principles and technique, we are now in a position to examine more critically its claim as a scientific system of educational theory and practice.

Our analysis of the Method in the preceding chapter has shown that Dr. Montessori's thought and procedure are founded upon six basic conceptions or principles. In order to facilitate further discussion and reference, it may be well to give here the following brief re-statement of these :—

1. The conception of auto-education, based upon the biological principle of spontaneity.

II. The principle which demands the formulation of a scientific pedagogy, an exact science of childhood. This science she claims to have established.

III. The conception of the need for a prepared environment scientifically determined.

IV. The biological principle of liberty.

V. The principle which insists upon the supreme importance of the pupil's individuality.

VI. The principle of education through the senses and muscles.

The student of Dr. Montessori's various works will be aware that their author nowhere states specifically that these are her fundamental conceptions. Indeed, one of the most strongly marked characteristics of her writings is their failure to enunciate directly and definitely the principles upon which her Method is founded. Along with numerous dogmatic assertions, unreasoned assumptions, naïve conclusions and merely rhetorical generalisations, she presents us, it is true, with many unassailable statements of educational doctrine and with many invaluable theoretical and practical suggestions. Again and again, too, she shows her realisation of the fundamentality of one or another of the principles enumerated above. But throughout her works we look in vain for that explicit

formulation of a system of thought and that logically ordered exposition which we have a right to expect from a twentieth century educational reformer, more especially from one who claims that her theory and practice are founded upon exact scientific investigation and experiment. We must take care not to overlook the following important short passage in which one of the six principles outlined above is expressly stated while three others are clearly implied : " The fundamental principle of scientific pedagogy must be, indeed, the *liberty of the pupil;*—such liberty as shall permit a development of individual, spontaneous manifestations of the child's nature. If a new and scientific pedagogy is to arise from the *study of the individual,* such study must occupy itself with the observation of *free* children."[1] Clear and comprehensive passages such as this are rare, however; and even in this it will be observed that fundamentality is definitely ascribed to the principle of liberty only. As may be learned from the quotations in our preceding chapter, which are taken from widely separated portions of her works, her usual practice is to concentrate her own and the reader's attention upon one or two of her principles, while apparently ignoring their intimate association with and dependence upon the others. Thus she makes no attempt to organise a complete and homogeneous body of scientific principles. The

[1] *The Montessori Method,* p. 28.

truth seems to be that Dr. Montessori's powers of induction and deduction, of analysis and synthesis, of argument and exposition are far from being commensurate with that genius which has given her such a wonderful insight to child life and its educational needs.

Unfortunately, the defects to which we have referred have led to regrettable results. Because of them many teachers and students who have with enthusiasm adopted the Montessori Method have misunderstood its fundamental conceptions, and in consequence have misinterpreted its practical suggestions and misapplied its didactic materials. They have over-emphasised this principle or that without appreciating the modifying influence of the others. We have, for example, seen pupils in so-called Montessori classes allowed complete freedom, for as long as possible, by teachers who had failed to grasp the full significance of the conception of a scientifically prepared environment. For as long as possible, we have said; for in an ill-provided or unintelligently ordered environment the free activities of the little ones are not attracted into that absorbing educational employment of which Dr. Montessori gives such eloquent accounts. The freedom consequently leads to confusion and disorder, and is at frequent intervals withdrawn through the interposition of the will of the teacher, who induces the pupils to work with one or another

piece of apparatus : and in so doing, of course, she violates the principles of spontaneity and individuality. Much adverse criticism of the Method, too, and much of the opposition to its introduction to our schools are due to those defects described above.

There are in this country numerous ardent adherents of the Montessori movement, and to them the suggestion is here offered for what it is worth that possibly their greatest service to the cause they have at heart could be rendered through the authoritative systematisation of the teachings of their leader. The Society which has been formed " to help the diffusion of the Montessori Method by all possible means " might well consider the advisability of undertaking this work. It could appoint a competent Special Committee charged with the duty of formulating a completely unified and logical system, embodying all the data and first principles of the Method. Further efforts of the Committee might most advantageously be devoted to either a demonstration or an inquiry as to the extent to which such a unified system of educational theory finds its most valuable practical application in the present didactic material and general technique of the Method. This enterprise would very probably win Dr. Montessori's sympathy and approval, if not, indeed, her active collaboration. Its successful conclusion could scarcely fail to pro-

mote the desired diffusion of the Method; for the confusion which apparently exists at present in the minds of many critics, teachers, and students concerning the real content, meaning and implications of the Montessori theory would thereby be removed. The Society, too, might no longer find it necessary to make the somewhat sinister proclamation that one of its four main objects is the defence of Montessori doctrine and practice against "misrepresentations and falsifications," so many of which have undoubtedly been due to defective presentation by the reformer herself.

There is no intention of maintaining here that the systematisation of Dr. Montessori's thought and its definite relation to her apparatus and general procedure would place her work beyond the reach of adverse criticism. But undoubtedly one very desirable result of the successful conclusion of such an enterprise as we have suggested would be that adverse criticism would be rendered more intelligent and more constructive, and, therefore, much more valuable. Inevitably, her work, like that of all other educational pioneers, is far from being perfect. It has been given to the world as something incomplete but capable of growth and development, and we are given to understand that its author is still engaged in such thought and research as may make for its further progress. Indeed, the real test of its permanent value must be the extent to

which it is capable of that modification and adaptation which the evolutionary development of educational theory and practice in general will inexorably demand. Suggestive and constructive criticism, based upon scientific knowledge and the teachings of experience, is the grand means by which any theory or method possessing permanent value may be so modified and adapted that it can continuously conform to the requirements of progress. In addition to the general knowledge supplied by science and experience it is essential, however, if the best results are to follow from such criticism, that those who offer it shall possess full specific knowledge and understanding of that against which it is directed. And obviously this full knowledge and understanding are not readily and certainly obtainable when the reformer responsible for the theory or method has failed to formulate and expound it systematically and clearly so that all reasonable doubt as to its meaning and implications is removed. This failure on the part of the reformer leads to really serious difficulties when we are concerned with such a large and complicated mass of theories and practical details as the Montessori Method comprises. It would seem, then, that the case for the systematisation of its founder's educational thought is a strong one. The undertaking, indeed, cannot be entered upon too soon. And pending or failing a successful issue therefrom, individual students and critics must

continue their efforts to discover all the truth involved in the Method and to expound and evaluate its principles and practice.

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It is often claimed that the Montessori Method is founded upon biology, or at least that its basic conceptions, its apparatus, and its characteristic activities are in close accord with the teachings of that science. Its author writes on " the biological concept of liberty in pedagogy" ; declares there exists only one real biological manifestation—the living individual ; claims to find support for her educational doctrine in modern theories of evolution from Naegeli to De Vries ; discusses very superficially the part—which she asserts is a *secondary* one—played by environment in organic life and its development ; suggests again and again throughout her writings, sometimes clearly but often vaguely and generally, that her data are drawn from biology and that her technique is determined by its laws. Probably few critics will challenge the statement that all the fundamental ideas enumerated on a previous page of this chapter are, more or less obviously, in accord with those laws. And there can be little doubt that in defining education as " the active *help* given to the normal expansion of the life of the child " Dr. Montessori is thinking

biologically ; for by "normal expansion" she clearly means simple organic development unaided by any external volitional agency.

And there can be no doubt that in so far as Montessori principles and practice are in true accord with the teaching of biology they are unassailable. It is a truism that education is intimately related to human life—is in fact an integral part of it. In every human community from the lowest to the highest some kind of formal education is consciously applied to achieve more or less definite ends. Simple organic human life is to be found nowhere. Even among the most savage tribes man makes some willed efforts, however crudely conceived, which raise himself and his offspring above the level of mere animal existence. And all such efforts are constituent elements of what we call education. It seems clear, then, that education is simply the complement of organic life. For the human race it is the volitional complement of evolution : for the individual it is the volitional complement of his ordinary organic growth and development.

This ordinary organic growth and development, which we have called simple in order to distinguish it from that much more involved growth and development due to the conjoint forces of organic life and of volitional educative agencies, is in reality something of very great complexity. It results

from the constant action and reaction of organism and environment in which function originated and through which its existence is continued. And under these three biological categories—organism, environment, function—is included all that we have learned or can learn of organic life, its expansion and development. The human organism possesses at birth certain potentialities, tendencies, adaptabilities. All these are, however, relative to an environment interaction with which will make possible efficient functioning. Defects in either the organism or the environment will involve inefficient functioning and will prevent normal existence, growth and development. In advanced society today every effort is made to remedy defects of the former kind. If we find them irremediable we acknowledge the inability of the defective organism to function to the best advantage in our ordinary environment and remove it to one specially prepared: hence our institutions for the physically, mentally, and morally deficient. We are also always consciously seeking to remedy defects in the environment. With the greater and more deliberate efforts made for this purpose the history of mankind is largely concerned. Cases of imperfect functioning, of defective adjustment between the individual and his highly complex modern environment, are easily noticeable, and almost always there is available in civilised society some

personal or institutional agency which can provide remedies or more favourable conditions of life. And in order to preserve the continuity of our argument we may remind ourselves in passing that even in normal civilised life, in which there are no defects requiring special treatment, mankind has devised elaborate means for the modification of the conditions of growth and development.

From the standpoint of science it would seem, then, that normal human life consists of two great parts, which include all its multifarious phenomena, manifestations, phases, aspects, activities, and which are, at least in civilised society, indissolubly inter-related. The first part is that simple organic life of which we have been speaking, and which we have seen to exist, expand and develop in and through the effective functioning arising from complete adjustment between organism and environment. For the purposes of analysis we can regard this as being completely independent of all volition external to the organism. The second part is the sum total of the results achieved by all willed efforts to modify the first. Thus each normal individual life is the joint product of two great sets of processes: one belonging to Nature, being non-voluntary, undetermined by external consciousness, and proceeding along the lines of evolution; the other belonging to Nurture, being voluntary, definitely arranged by external consciousness, and

proceeding, at its best, along the lines indicated by science. And science is making it increasingly clear that in their purpose of enlarging, enriching and ennobling life these processes of the second group can succeed in so far only as they proceed in alliance and accord with those of the first group. Not only all the ways and means which ought to be involved in these volitional processes, and the paths along which their progress ought to be directed, but also the intermediate and ultimate objectives which they may reach are pre-determined by Nature. Now, when the term *education* is used in its widest extension all the processes it denotes are identical with those of this second group. Hence in our own particular universe of thought we are concerned with only two great sets of factors—organic life and education, the latter, as we have clearly seen, being entirely dependent upon and complementary to the former.

The foregoing is a very brief account of what may be called the biological conception of education. It is obviously the ultimate conception, inclusive as it is of all educational principles and practice. We must note, however, that education has become a somewhat technical term, with a more or less specific meaning which is narrower than that assigned to it here. We have shown that it includes *all* willed efforts to modify the expanding and developing life of the educable organism. Thus it

includes the educative agencies of the home, of the church, of such organisations as the Boy Scouts and Girl Guides, and of schools of all types. But in its more technical sense it is concerned primarily with the last named. The narrowing of its meaning in this way is, however, more apparent than real. Schools are highly specialised institutions whose activities should conform to every sound educational principle, so that their practice may always be the most enlightened that is known. It should be possible for all other formative and developmental agencies, more especially the home, to look to the school for knowledge and guidance in regard to their most important work. When, therefore, the professional educator concentrates his attention upon school work and its theories, systems, and methods, it must not be assumed that he fails to recognise the importance of other agencies or ignores their needs and claims. His concentration is justified by the magnitude and importance of the task assigned to the school, the wide range of its activities, and the numerous opportunities and facilities it affords for the study of theory and practice. He recognises that every educational activity, wherever practised, is dependent for its success upon conformity to the laws of human life and its development; and he may modestly claim that the results of his skilled inquiries concerning the nature and application of these laws

may assist materially in the educative work of the home, the church, and all kinds of organisations. It should be noted in passing that Dr. Montessori and her followers do not lose sight of the feasibility and desirability of introducing the Method into the home. But it must be added that unless parents and others who adopt it for home use are willing and able to study carefully its principles and technique desirable results cannot possibly be obtained.

Our discussion should have made it evident that the principles of education—which, of course, determine its practice—must be drawn from biology, the science which studies the evolution, nature, and needs of the human organism and ascertains the laws of its being, growth and development. When, therefore, a body of educational doctrine and dependent technique, claiming to meet all the requirements of at least the earlier years of school life, is offered by its founder for general acceptance by the educators of the world, it must be closely examined from the biological point of view. Its possession of merely negative virtues, in that it does not transgress any of the laws of biology, cannot be considered sufficient. It must be positively based on that science and must incorporate all of its principles that have educational significance. Judged by this standard, the Montessori Method is found to have several defects. As it is impossible within the limits of this chapter—concerned as it

necessarily is with a great variety of topics—to offer a detailed criticism of the Method from any standpoint, we shall consider here only its more obvious fundamental imperfections.

Dr. Montessori has apparently failed to grasp the meaning and to appreciate the immense significance of the biological trinity comprising organism, environment and function; has apparently failed to perceive that none of these three can be completely studied or understood apart from the other two, for they constitute a true trinity because of their essential unity. Her writings contain comparatively little evidence of her study of the child as an organism, and no evidence at all of that complete biological study of the educand which we have seen to be necessary. Her unscientific view of environment as a factor of only secondary importance in life has been pointed out in a previous paragraph. It seems very strange that she has failed to realise that just as an organism can have no existence apart from environment it can have no complete meaning apart from considerations of environment. It seems clear that her study of biology has not revealed to her the fundamentally vital nature of the processes of adjustment perpetually in progress between the organism and its environment. Surely it is now a matter of universal knowledge that life, whether considered physically, mentally, morally, socially or æsthetically, cannot possibly have

existence without a suitable environment; and that in all these respects it must be imperfect if the environment is imperfect. And further, even if the latter were perfect life would inevitably fall short of perfection if the processes of adjustment were in any way weakened or impeded. Failing to perceive all this, Dr. Montessori has, of course, failed to understand the origin, nature, and supreme significance of function. Function, as we have seen, evolved through the perpetual dynamic inter-relation of organism and environment. In variety and complexity it has developed in a marvellous manner, including, as it does, every possible activity in which an organism can engage.

The organism functions, acts and reacts. Nevertheless, activity is not merely of the organism alone. The essential fact to be noted by every student of human life, more especially by the educator, and above all by the founder of a system or method of education claiming biological bases, is this: that every activity, whether conscious or unconscious, has reference, direct or indirect, to the environment; that every activity maintains or alters some simple or complex relationship between organism and environment, or tends to do so. It will now be clear to the reader that when Dr. Montessori says "*Environment* is undoubtedly a *secondary* factor in the phenomena of life"[2] she confesses her

[2] *The Montessori Method*. p. 105.

failure to understand and evaluate one of the most profound and most suggestive ideas which the biologist has contributed to the theory of education. On the same page she says "The origins of the *development,* both in the species and in the individual, *lie within.*" They do, but not within the organism alone: they lie within the trinity we have discussed above; and if they are considered apart from environment—one of the co-equal members of that trinity—misunderstanding and abortive thinking in regard to their meaning and purpose become inevitable. The results of this misunderstanding and confusion of thought would long ago have raised insuperable obstacles to the progress of the Method were it not that its practice, as we shall see more clearly when we come to discuss the third of the fundamental principles enunciated at the beginning of this chapter, is in this respect much more closely in accord than is its theory with the nature and needs of the educative process.

Considered from the biological point of view, perhaps the most serious defects in Dr. Montessori's educational thought are due to her failure to realise the supreme importance of the nervous system, to which throughout her writings there are curiously few references. It will be obvious to the reader that no investigator who is unaware of the immense significance of this system in the phenomena of life can possibly make adequate

biological study of the human organism and its growth and development. In this connection several facts, or sets of facts, demand most careful consideration. In the first place it must be noted that it is the nervous system that unifies the merely physical constitution of the organism, that associates the several highly specialised organs and multifarious organic elements into the complex physical unity which we call the human body. In the second place it must be remembered that it is in this system, including as it does the brain and spinal cord, that body and mind find their subtile union while preserving in large measure their disparate entities. It is through its wonderfully delicate and intricate operations that *soma* and *psyche* are indissolubly inter-related in the single educable organism, the body-mind. It is very unfortunate that this conception of the educand as a body-mind, a conception which is an essential part of the educational thought of to-day, seems to have escaped the notice of Dr. Montessori, who does not discuss it in any of her writings. Thirdly, considerations arising from the contemplation of the phylogenetic significance of the nervous system not only emphasise the importance of the conception to which we have just referred, but also strongly support the present day psychologists who believe that many of the problems of their science cannot be solved without the aid of biological interpretation.

For there can be little doubt that it was through the developing complexity and the gradual specialisation of grouped and inter-grouped elements in that system that mind itself evolved. And now-a-days even junior students of education are aware that there is no gateway or avenue of approach to the mind which does not open or lead along some nerve path. Fourthly, the nervous system is the grand means by which organism, environment, and function are unified in the perfect trinity discussed in two previous paragraphs. And finally, it must be pointed out, even at the risk of repetition, that it is through the superior development of its nervous system that the human organism is endowed with educability. Whatever great ends it may reach, and whatever grand purposes it may fulfil, the primary achievement of the educative process is the modification of the central nervous system. Perception, memory, attention, will—not to mention other mental states and activities—are dependent upon nerve connexions in the brain. All involuntary, reflex and instinctive action is dependent upon connexions in the lower nerve centres. The building of habits, too, which play such a large and important part in education and in the general economy of life; the formation of engram complexes; the constitution of primary dispositions and the acquisition of secondary dispositions; "coherent progressiveness and adaptiveness"; "the

organism's general power to create unity in diversity" ; all these are dependent upon the capacity and tendency of the nervous system to form permanent " paths " or connexions which constitute distinct unities of component elements from both the lower and higher levels of the organism's nature.

It is submitted that no further argument is necessary to demonstrate that it is impossible to formulate a complete and acceptable theory, or set of theories, of education without incorporating therein the results of a scientific investigation of the neurological aspects of its data and first principles. And yet Dr. Montessori, greatly daring, has attempted this impossible task : for in the absence from her pages of any account of these results we must assume that she has not undertaken such an investigation. Again, apart altogether from other grounds for scepticism, educators cannot be expected to accept without anxious questioning the elaborated patented apparatus and special school-room procedure of the Montessori Method until they are convinced after scientific inquiry that these do not make any undue demands upon the delicate nervous system of the very young child, and that they do not by their inevitable limitations impede or retard that many-sided adaptation to the varied environment which is essential for maximal development. Several parents

and teachers have informed the present writer that they have observed that the use of the apparatus does produce undue excitement, strain and fatigue in "highly strung" children, and occasionally even in those of more steady balance and equable temperament. Such cases might, however, occur under any existing educational system, and it is hoped that their citation here will not be regarded as unfair comment or as hypercriticism of the Montessori Method. But the fact of their occurrence is significant and serves to emphasise the need for the neurological investigation here suggested.

Perhaps enough has now been said to prove that Dr. Montessori's principles and practice are not directly and definitely founded upon biology. But it may be added that while it is true that her six fundamental principles, which we shall presently proceed to consider singly, as well as much of her technique, are in general accord with the biological conception of education, yet they can never be given their fullest and clearest meaning, or their sanest and most useful application, until she frankly accepts that conception and all its implications. Such frank acceptance, which might mean so much to the cause of educational progress, but which might involve great additional study and experimentation, withdrawal from hardly won positions, mental anguish, and even sacrifice, yet

does not seem impossible for a reformer of Dr. Montessori's vision and greatness of spirit. As matters stand at present, the fairly obvious deficiencies of the Method, as judged by biological standards, and the reliance of its founder and her followers upon what Professor Adamson calls " the somewhat superstitious or pedantic use of one definite set of apparatus,"[3] seem to foredoom it to sterilisation and to consequent failure as a progressive solution of the problems of infant education. Under existing circumstances it appears to be inevitable that the Method will be superseded by others which make wiser provision for the needs of expanding child life and whose practice and didactic material are less rigid, and therefore more adaptable to the requirements of individual teachers, schools and homes.

Having shown that Dr. Montessori's work is not directly and definitely based upon the science of biology, we have now perhaps reached the most convenient point at which to consider her claim to have established a scientific pedagogy. We shall thus postpone for a few pages our examination of the first of her six basic conceptions in favour of the second. Now, when we come to consider her science of pedagogy several questions present themselves. Is it a new and distinct science, or are her data and principles, her facts, hypotheses, and

[3] *A Short History of Education*, p. 351.

method, borrowed from various sciences? Why has she not provided us with a clear and full account of her observations, inductive and deductive inferences, her formulation and testing of hypotheses? Precisely what experiments has she made, and what special precautionary measures has she found necessary to avoid drawing erroneous conclusions therefrom? To these questions she supplies no satisfactory answers. In regard to the first she makes the following somewhat vague statement: "This new pedagogy accordingly belongs to the series of modern sciences, and not to antique speculations, although it is not based on the purely metric studies of 'positive psychology.' But the 'method' which informs it—namely, experiment, observation, evidence or proof, the recognition of new phenomena, their reproduction and utilisation, undoubtedly place it among the experimental sciences."[4] As the questions asked above suggest, Dr. Montessori, unlike the true scientific investigator, does not give any detailed account of her experiments and observations, does not attempt to demonstrate the value of her evidence or the validity of her proof, and does not give to other investigators any real guidance in regard to the recognition, reproduction and utilisation of new phenomena—or, indeed, of the phenomena with which, according to her claims,

[4] *The Advanced Montessori Method,* Vol. I., p. 74.

her own researches have been concerned. Serious research students, anxious to work in her particular field of inquiry, examine her pages in vain for any definite lead and direction—such as may be obtained from the works of any scientist worthy of the name—as to how and where to begin, as to immediate and ultimate objectives, special method, special precautions, those portions of the field already explored and those still to be explored. Surely, if she wishes to justify her claim to have established a new science of pedagogy, she ought to invite in the most frank and cordial way the co-operation of trained investigators who could test her testimony and assist in the extension of her work. Indeed, it may be claimed that she ought to have done this before finally formulating her method and her science. For, as Professor Welton says, " No formulation of method can be satisfactory which drops out of sight ' the complex interchange of opinion, observations, experimental results, criticisms—the division of labour—that constitutes the life of science.' "[5]

From the point of view of methodology Dr. Montessori's work is far from being satisfactory. She observes certain facts of child life, certain " spontaneous manifestations," but gives no clear indication as to whether or how she takes the next

[5] *The Logical Basis of Education*, p. 109. His quotation is from Ravenshear, Article on Testimony and Authority, *Mind*, N.S., Vol. VII., p. 63.

step in the methodical process of scientific investigation. This next step, as MM. Langlois and Seignobos have shown, is to formulate a series of questions based on some definite method or system. As these writers say, "every science is composed of the answers to such a series of questions;"[6] and, of course, a due proportion of these questions begins with "why," or some of its equivalents. Dr. Montessori gives us very little information concerning her questions and the answers she has found to them. She supplies us with no evidence of the seriate arrangement of the former or the systematisation of the latter. Far too seldom she asks why, and pauses for a clear answer between her observation of manifestations and her decision as to the apparatus to provide. Far too frequently she is content to arrange and adapt her material and procedure in accordance with mere manifestations, without inquiring into the real nature of the phenomena and without seeking for the universal relations and laws of whose truth and application these are but examples. Unfortunately, in regard to the relationship between the manifestations of phenomena and the laws which they exemplify her thought appears to be confused. Thus, assuming that her own apparatus is scientific, she writes: "The scientific instrument must

6 *Introduction to the Study of History*, trans. Berry; p. 214. Quoted by Welton.

be constructed on a basis of *exactitude*. Just as the lenses of the physicist are constructed in accordance with the laws of refraction of light, so the pedagogic instrument should be based on the *psychical manifestations* of the child."[7] Here it is obvious that she has failed to realise the profound difference between manifestations and laws, and is consequently open to the serious charge of being unaware of the immense difference in value between apparatus and activities suggested by the former and those which are definitely determined by the latter. It is impossible to imagine a true scientist being guilty of such confused thinking; but such is, unfortunately, far too frequently found in the work of Dr. Montessori. The above quotation of a characteristic passage contains clear evidence against the claims of her pedagogy to be ranked in " the series of modern sciences."

Again, it must be pointed out that, so far as can be ascertained from her writings, her modes of research and the steps she usually takes do not present the general characteristics of methodical process. " These characteristics," says Professor Welton, " may be summed up by saying that *methodical process omits nothing, takes up the points one by one, and takes them up in such an order that it goes from the starting-point to the*

[7] *The Advanced Montessori Method*, Vol. I., p. 72. The *italics* are her own.

fulfilment of the purpose by consecutive steps, each of which is seen in its true relation to every other step, and to the enquiry as a whole."[8] A definite starting-point and a definite purpose are absolutely essential. But Dr. Montessori often leaves us in doubt as to either or both. Thus, immediately following the passage quoted above, and dealing with a matter that is obviously of vital importance in her Method, occurs the following: "Such an instrument may be compared to a systematised 'mental test.' It is not, however, established upon a basis of external measurement, for the purpose of estimating the amount of instantaneous psychical reaction which it produces; it is, on the contrary, a stimulus which is itself determined by the psychical reactions it is capable of producing and maintaining permanently. It is the psychical reaction, therefore, that in this case determines and establishes the systematic 'mental test.' The psychical reaction which constitutes the sole basis of comparison in the determination of the tests, is *a polarisation of the attention* and *the repetition of the actions* related to it." It must be said at once that while this is not the sheer nonsense which on a first reading it may appear to be, it is not the kind of statement we expect from a scientific thinker and worker. Here again we have to note the confusion of thought, the absence of methodical pro-

[8] *Op. cit.*, p. 116. The *italics* are his.

cess, and the undue reliance upon the mere manifestations of psychical reactions without reference to the laws of which they are only particular illustrations. We are told that her apparatus is a stimulus which produces and maintains certain reactions and that these reactions themselves determine the stimulus. But we are not told which comes first, or where the observations and experiments begin. Yet, for the truly scientific investigation of phenomena we know that a definite starting-point is an indispensable condition.

The truth seems to be that in the designing and arranging of her apparatus Dr. Montessori worked from several starting-points. Sometimes, as we saw in our last chapter, she adopted the material and contrivances of her predecessors, introducing such modifications and additions as were suggested by her own observations. Sometimes she started with her observations and tentatively produced such devices as appeared to meet immediate requirements, afterwards improving or replacing these as more accurate and more minute observation suggested. Again, her extensive general knowledge of child nature, her intuitive appreciation of ways and means of satisfying its developmental needs, her insight and great-hearted sympathy led to the invention and improvement of several of her " instruments " and " stimuli." And in the same

ways, *mutatis mutandis,* her educational thought and general school-room procedure were initiated and developed. Now, in all this there is little that can properly be called scientific. The majority of the activities indicated here could be carried on at an empirical level. By far the greater part of her so-called experimentation was clearly nothing more than the somewhat crude application of the method of "trial and error," not leading to or directed by hypotheses or laws.

It was pointed out in the previous chapter[9] that Dr. Montessori views with disfavour the work of the experimental psychologist. And in the short passages we have just considered she emphasises the fact that her own work is not based on the metric studies of psychology and that she has not sought to measure the amount of any psychic reaction. Yet she claims that her apparatus has been constructed on a basis of exactitude. The tests of exactitude which she accepts are the polarisation of the child's attention and his repetition of the actions involved in the use of the apparatus. She claims to be able to determine "with the greatest precision" both the quality and the quantity of her stimuli. We are not always able to decide where she begins, but it appears that the "precision" is attained by a process of gradual approximation

[9] *Supra,* pp. 236 and 237.

continued until the polarisation and repetition take place. Thus she makes use of expedient and calls it experiment, of empiricism and calls it science.

But we must go further. We must question the value of her two tests. For it seems highly probable that when the experimental psychologist comes to examine in his coldly scientific way the nature and the claims of these tests he will find that what she so confidently describes as polarisation of attention is nothing of the sort, and that the rapt attitude, the complete absorption, of which she writes so enthusiastically, and the repetition upon which she bases so much, are due to mere sensuous enjoyment which may commonly be unaccompanied by any mental activity of really educative significance.

She gives a graphic account of the absorption of a little girl, three years old, who was using a set of the solid insets which were removed and replaced forty-four times in spite of the most deliberate attempts to interfere with the occupation. This phenomenon, she says, became common among the children; and on the strength of this fact she formulated her two tests, which she appears to regard as infallible. Now, it seems clear that here Dr. Montessori's psychology is at fault. We may well inquire whether or not when studying the manifestations of this phenomenon, and interpreting

its educational implications, she was labouring under what Professor Welton calls " the obsession of the superstition that interest and pleasure are synonymous—that absorption means attention."[10] It is true that the physical concomitants of mere absorption somewhat closely resemble those of polarised attention ; each is outwardly characterised by a rapt appearance, a concentrated gaze, and an intent attitude. Because of this fact it often happens that the superficial student of child life, working empirically, is misled by external appearances and fails to differentiate these two mental phenomena. Psychologically considered they are essentially different. For polarisation of attention both purpose and intellectual interest are necessary : for absorption no purpose is required, and merely emotional interest or sensuous pleasure is sufficient. Considered from the educational point of view clear discrimination between the two phenomena is of the utmost importance. Every educator is aware of the great part played by polarised attention in the acquisition, organisation, and functioning of experience, and thus in the general growth and development of mental life. Mere absorption, on the other hand, being without purpose and intellectual interest, and involving no effort, is almost wholly quiescent and recreative. It can do no more towards promoting mental de-

[10] *The Psychology of Education*, p. 239.

velopment than basking in the sunshine or lying in a hammock can do towards promoting physical development.

In the published accounts of her study of children who were using her apparatus Dr. Montessori gives no evidence of her realisation of the need for the discrimination to which we have referred. She assumes that the experience of the little girl mentioned above was one involving polarised attention. But having pointed out that the child ended her monotonous repetition of the simple movements independently of all distracting external stimuli, she very naïvely concludes her account thus: "And she looked round with a satisfied air, almost as if awaking from a refreshing nap." This last statement seems to concede the point we are endeavouring to make. For a refreshing nap has extremely little in common with an experience involving polarised attention, and a child who has just had the latter would not behave as one awaking from the former. On the other hand, simple absorption, has a very great deal in common with a refreshing nap. The former is, indeed, a refreshing experience. The conclusion is almost forced upon one that the phenomenon upon which Dr. Montessori has based so much is nothing more than mere absorption, while the repetition is due to the appetitive tendency to prolong the sensuous enjoyment

accompanying the movements. And if this be so, it is clear that the value of her two tests is very much less than she assumes it to be.

Again, even if it be granted that the attention of a child is polarised during the period in which he is using the apparatus there remains another difficulty which she does not seem to have considered. She does not appear to have made any serious attempt to ascertain whether that with which the polarised attention is apparently concerned is that with which it is really concerned. Yet, most students of both child and adult life must have often observed that one may seem to be attending to an object, or to a process involving simple and pleasant physical activity, while in reality his consciousness is focally concerned with something altogether different in nature, place, time, and circumstance. And when this occurs in the Montessori school the apparatus is not, of course, doing the great things its inventor fondly assumes, while the tests she applies to it and to its users give very misleading results.

If we may judge from her writings, and the published reports of her lectures and demonstrations, she has not yet made a very profound study of the psychological laws of attention and movement upon which the whole of her work is so vitally dependent. She gives very little or no consideration

to the important and useful distinction between the focal and marginal aspects, and to that between the active and the so-called passive aspects of attention. Nor does she, either explicitly or by implication, consider the direct bearing upon her work of the psychologist's analysis of the process of attention. One cannot conclude that she clearly realises the fact that the active attention of even the very young child involves selection, inhibition, and the distribution of emphasis. From the standpoint of education it is almost impossible to exaggerate the importance of attention. Even recent writers, who do not, of course, accept the "faculty" psychology, describe it as the one faculty of mind. Yet, Dr. Montessori has been content to do little more than study its phenomena empirically through observation of their manifestations. One can hardly wonder that she has fallen into the grave error of confusing it with mere unproductive absorption. Her study of movement—of such fundamental significance in a system of education so dependent as hers upon self-activity—is also unscientific. She has observed it carefully, it is true, but as in other parts of her work, the results of her observation have not been dealt with in accordance with the canons of scientific method. She provides us with no definite classification of movements, although it must be obvious that such

a classification, accompanied by clear description, would be of the greatest practical value, especially to the educator of very young children. Their movements range from pure physiological reflexes, through sensation reflexes and impulsive activities, up to purposive actions, which may be either ideo-motor or volitional. She often assumes that the activities of the little ones while using her apparatus are volitional when they are only ideo-motor, or even merely sensori-motor, and therefore of considerably less developmental value than she ascribes to them.

Our brief discussion of some of the chief points arising out of Dr. Montessori's claim to have formulated a new science of pedagogy suggests that there are cogent reasons for refusing to acknowledge that claim. It is acknowledged that she has made most valuable contributions to the science, as well as to the art, of education. But we are compelled to conclude that she has not established any new science. She has borrowed a great deal from other sciences, notably from biology, physiology and psychology. That is, of course, legitimate procedure and must be followed by every educational reformer and thinker. Her child-study work is of the greatest value. Her insistence upon the paidocentric conception of educational theory and practice is in full accord with the most

enlightened thought of to-day. We all agree with her contention that the child, his educational needs, and the means employed to meet these needs must be studied scientifically. Further we nearly all agree that she has greatly helped us in that essential work. But we must repeat that she has established no new and distinct science of pedagogy. Indeed, the fact must be emphasised that she has often misinterpreted, and often failed to utilise some of the most pregnant principles of the existing sciences upon which education must be founded.

Not only, then, must it be definitely asserted that she has not formulated a science; but also that, in so far as her work as an educational reformer is concerned, she is not a scientist. To any careful student of her writings the general impression is conveyed that here is a great enthusiast, great as Pestalozzi; here is a great reformer who sees that science alone can give us true conceptions of education; here is a great woman who loves children, of whom she has amazing intuitive and experimental knowledge; here too is a great teacher: but she is not a scientist, and does not think or write as one. Her brief "Guide to Psychological Observation,"[11] consists merely of a number of points to note. It gives the student no direction or suggestion as to

[11] *Advanced Montessori Method*: Vol. I., pp. 123 and 124.

what to do afterwards with the simple records. Her students and "directresses" are constantly being urged to observe the children, as if observation alone were sufficient. She lightly dismisses the "arbitrary and superficial" work of Binet and Simon. But her own so-called anthropometrical observations, of the results of which she makes no definite application, may well be described as arbitrary and superficial. In her chapter entitled, "My Contribution to Experimental Science,"[12] she gives a number of curves which at first sight are impressive, but which on examination are found to serve as very simple means of recording the results of superficial observations. The whole chapter, notwithstanding its promising title, supplies very little information in regard to true experimental work, hypotheses, or laws. The whole book in which it is included—the so-called *Advanced Montessori Method*—fails to impress one as the work of a scientist.

We are now in a position to enter upon our postponed examination of the first fundamental principle of the Method. Few present-day educators will refuse to accept the principle of auto-education. Ultimate analyses reveal the fact that in a very real sense there is no other kind of education. We may instruct the child, may arrange his environment in the light of the most recent scien-

[12] *Ibid*, Chap. III.

tific investigations, may provide ingenious apparatus, may arrange and organise and skilfully present to him the materials of knowledge, may facilitate in innumerable ways his growth and development; and in doing all this wisely and well may earn for ourselves the title of educator: but in very truth he educates himself, and, moreover, does it best by being himself, by living and behaving according to the laws of his nature.

Realising this truth, Dr. Montessori bases all her work ultimately upon this first principle of auto-education, although she does not state this fact as clearly as she ought. Her theory, upon which, however, she does not act consistently, is that the child should in a sense take the initiative; that we must await, provide for, and utilise his spontaneous activities and manifestations of needs. Hence the prominent place given in her writings and lectures to the principle of spontaneity. This principle presents grave difficulties to both the philosopher and the scientist, and has been the cause of a good deal of confused thinking. The chief difficulties rise from the fact that *spontaneity* is essentially a relative term whose connotation and denotation it is exceedingly difficult, if not impossible, to determine. Spontaneity is a type of activity, but a type only relatively differentiated. All cases of activity may be included under two

general classes—transeunt and immanent. In transeunt activity one object acts upon another. Immanent or self-activity takes place within the active object and is in no way influenced by other things. But it is extremely doubtful that there is any such thing as purely immanent activity. If the view put forward in earlier pages of this chapter—that organism, environment and function are indissolubly inter-related in a perfect vital trinity—be correct there is most certainly no such activity possible for any organism as such. Professor J. M. Baldwin[13] defines spontaneity as a type of activity in which inner or immanent elements predominate. Here he accepts the relativity of its meaning. He goes on to state that it is a conception relative to transeunt or mechanical causation, on the one side, and to self-activity on the other, and that the adjective *spontaneous* is applied to functions which are relatively independent of external stimulation or causation. In regard to mental life he points out in another article that it is difficult to see what a psychic principle of self-activity could be. For it could not be knowledge, since that is in some degree conditioned by its object; nor volition, since that involves ends which, as knowledge, are also objects; nor yet feeling, since that seems most of all under organic conditions. If a mind or a whole organism were really self-active it would be

[13] *Dictionary of Philosophy and Psychology.*

absolute : and to such a conception of either the clear teaching of biology is definitely opposed. The statement that spontaneity is a conception relative to self-activity, which is itself necessarily a relative conception, is not very clarifying, however closely it approximates to truth. Perhaps it is best to regard it from the biological standpoint as being the activity of an organism functioning in its environment without the immediate interposition of external volition.

Dr. Montessori must not be criticised severely for her inadequate treatment of this very abstruse and indefinite principle. But she does merit adverse criticism for her failure to appreciate the fact that it is abstruse and indefinite ; for her glib unqualified references to the biological principle of spontaneity ; for her unquestioning insistence upon the necessity of awaiting the spontaneous manifestations of the child ; as well as for such vague statements, made without any implication of the essentially relative meaning and value of the ideas expressed, as that the greatest triumph of education must be to bring about the spontaneous progress of the child, and that the spontaneous psychic development of the child continues indefinitely and is in direct relation to the psychic potentiality of the child himself. Statements like these, which are numerous in her books, are not helpful to practical teachers. In

order to help these, upon whom the success of her Method must largely depend, she must endeavour to state more clearly what she wishes them to understand by this basic principle. Even her negative admonition and advice—that they must not interfere with, arrest, suppress, suffocate any spontaneous action—cannot be at all helpful until she gives them clearer ideas as to what actions may be correctly so described. One is not much surprised to learn that now and then the idea occurs to the teacher struggling to grasp the full meaning of this elusive principle that the presence of the Montessori apparatus frequently and effectively leads to the suppression of certain legitimate spontaneous activities.

We are thus brought directly to the consideration of the third fundamental principle of the Method, that of the prepared environment. At once the question arises whether the provision of a prepared environment is not opposed to the principle of spontaneity. Can the child be said to act spontaneously when his activities are mainly those by which he enters into certain relationships with environmental elements determined and arranged by others? Is he acting spontaneously when he yields to the attractiveness and suggestiveness of ingeniously devised apparatus? Dr. Montessori's answer is in effect that spontaneity

manifests itself in accordance with the laws of the child's life and development, which laws are ascertainable by science; that these same laws determine the environmental elements best suited to each period and phase of his expanding life; that her science has enabled her to understand these laws; and that, guided by them, she has devised an environment which, however arbitrary and artificial it may appear, is nevertheless natural, and therefore affords appropriate reactions to, encourages, and brings to fruition the child's spontaneous activities. Thus she sees no incompatibility between her first and third principles inasmuch as they are reconciled by the working out of the second. It is unnecessary to emphasise further her inconsistency in proclaiming that environment is a merely secondary factor in vital phenomena while at the same time she has endeavoured to embody in organised environmental material almost all her essential ideas and ideals. There can be little doubt that the great majority of parents, teachers, and students who are interested in the Method, either as advocates or opponents, look upon this material as the embodiment of almost everything of importance for which Dr. Montessori stands, and round it has raged most of the controversies aroused by her work.

If the biological conception of education we have ventured to put forward in these pages be the true conception, it follows that the educator cannot regard spontaneous activity as being independent of the environment. Whatever the latter may be there will always be some spontaneous activity in relation to it. But such activity may have very great or very little or even no developmental value. This value depends upon the extent to which the environment contains elements sufficiently numerous and varied to encourage and sustain every function having educative significance; elements that provide for the needs and interests of the child, and that enable him to put forth effort, without which he can make no real progress. Now, the sciences upon which education is based are constantly adding to our knowledge of the child and the modes and conditions of his growth and development; and we may hope that the time is not far distant when they will enable us to provide an environment which, for all practical purposes, will approximate to perfection. Towards the achievement of that most desirable end the work of Dr. Montessori has unquestionably helped very greatly. But as we have seen she has not justified all her claims as a scientist. The two tests upon which she mainly relied for the final determination of her organised material were found above to be

of doubtful value, and consequently we cannot accept her apparatus as being scientifically satisfactory.

She tells us that the children themselves are the final arbiters as to whether this or that material or arrangement is suitable; that they choose some and reject others. But we are not informed as to the range and variety of the objects presented to them. Surely it is reasonable to suggest that there are many means and contrivances to which science would attribute the highest value, but which she has never submitted to the arbiters. And if that be so she is most certainly not justified in her attempt to establish a rigid and narrow orthodoxy in the matter of apparatus. The attempt is premature, and if it were successful would obviously tend to retard progress. It is very unfortunate that she has found herself unable to rely upon the intrinsic merits of her devices, but has thought it necessary to secure for them the artificial support of the patent law. Her action in this respect seems alien to the spirit with which the history of education has made us familiar and which we almost all desire to find animating our work to-day. Nor is it in harmony with the spirit of scientific research. Scientists seldom patent even their most original and ingenious contrivances. Dr. Montessori would have rendered far greater service than she has to

the world of education if, having given it her grand ideas and ideals, she had remained content to demonstrate the possibility of founding directly upon her principles a complete, intelligent, and progressive practice. She could have pointed out the path of progress without standing in the way, and preventing others from following it. She could easily have made it impossible for any opponent to charge her with narrowness and commercialism.

Through her failure to acknowledge frankly to herself and others the inevitable defects and limitations of much of her apparatus she is withholding from the children opportunities for the enjoyment of greater freedom, and for the fuller expression of individuality. For this greater freedom and fuller expression there is required much more and varied material for the exercise of creative or constructive activities, much more that would readily lend itself to considerable alteration and adaptation by the thoughtful child. Also, she provides at present too little scope for those intelligent children who desire to explore and who seek to discover the hidden possibilities of manipulative materials. It is, too, worthy of note that in her insistence upon the use of her own particular apparatus she is quite unwarrantably interfering with the freedom and individuality of the teacher or directress. In regard to the general arrangement and order of her pre-

pared environment, as distinct from the patented apparatus, one is glad to acknowledge that she has greatly improved upon the practice of the past. The convenient and adaptable furniture and accessories of her schoolroom are admirably suited to the requirements of the little ones, enabling them to enjoy a large measure of physical freedom, and allowing them to practise simple activities of moral, social and domestic significance and of real educational value.

The freedom of the Montessori school is, of course, comparative, and need not be subjected to any profound philosophical examination. It was pointed out in the previous chapter that the true place in the theory of the Method to be assigned to the conception of freedom is that of a general essential *condition*. Upon freedom as a condition all the other basic principles are dependent. If the child is not free he cannot act spontaneously and educate himself. Unless he is free he will not behave naturally, and if he does not he cannot be scientifically observed and so a true science of pedagogy cannot be formulated. A prepared environment with an almost self-effacing directress can have little or no meaning and purpose unless the child is free to use it as and when he wills. Individuality cannot be adequately expressed by one who is not free. Children must have freedom to exercise muscles

and senses, to perceive and think, as they will ; and freedom to enter into such simple social and moral relationships as satisfy them. They must be free to be themselves. For that each shall be a true developing self is of supreme importance. And this, as everyone is aware who is familiar with the spirit and tone of the Montessori school, does not mean that children become selfish or too self-conscious.

Like other portions of her work, Dr. Montessori's treatment of the conception of freedom is lacking in thoroughness, definiteness, and consistency. Her exposition is not logically ordered and developed. Important statements of her views which would gain greatly in meaning and force by judicious collation and sequential discussion are found in widely separated portions of a book and even in different books. Although she claims " perfect liberty " for the child her common sense compels her to recognise that he can be allowed only comparative freedom. But she does not fairly meet and discuss the difficulties that arise from this fact. Her theoretical demand is for this perfect liberty, but in practice all undesirable tendencies and activities are rigorously suppressed, destroyed. She tells us that liberty is activity, and that in the social and moral spheres the child's liberty is to have both a limit and a form. The limit is the collective interest and the form that which we uni-

versally consider good breeding. Here again we have uncertainty and confusion of thought. She makes no real effort to effect an intellectual reconciliation between the modified freedom of the schoolroom and " perfect " liberty, or what she vaguely calls the " biological principle of liberty " ; makes no attempt to prove that children may be said to have freedom even when its limit and form are determined by others.

The conception of freedom is an exceedingly difficult one even for the philosopher, and criticism of Dr. Montessori's unsatisfactory treatment of it must not be too severe. Although not stated with clarity and due emphasis, her position may be said to agree in the main with that of some philosophers who consider it from the social and political standpoint. They say that liberty must have both negative and positive significance. On the one hand, there must be freedom from all unnecessary interference, from arbitrary restraint and constraint. On the other hand, there must be the positive provision of a social and political order which shall afford to the individual opportunities for the exercise and cultivation of his capacities.[14] If for " social and political order " we substitute " scientifically prepared environment," we have here a short statement of her position. This does not, of course, make the whole matter sufficiently

[14] *Vide* T. H. Green : Works, Vol. III., pp. 308 f.

clear to satisfy practical teachers and parents who are desirous of adopting the Method in their homes. They want a full, clear, and detailed exposition of the "concept of liberty," showing, with typical instances, the practical limitations found necessary. For their intellectual satisfaction they want a reasoned justification of the compromise which, without explanation or discussion, she seems to have tried to effect between the abstract and the concrete, the ideal and the actual interpretations of her principle of liberty. She makes many concessions to convention which necessitate deliberate interference with the liberty of the child. She teaches him, shows him how to do things, induces, guides, urges, and restrains him as occasion requires. All this may be justified because of the exigencies of practice, and Dr. Montessori's genius may enable her always to decide aright as to the kind and degree of interference. But those less gifted require clear precepts and principles of procedure.

Almost everything already written in this chapter by way of criticism of Dr. Montessori's exposition and application of her principles has bearing upon her conception and treatment of individuality. She asserts that there is only one real biological manifestation—the living individual, and that with individuals, one by one observed,

education is alone concerned. She apparently wishes us to understand that the fundamental principles of her Method have been formulated from the results obtained by the study of individuals, one by one scientifically observed. But it has already been pointed out that these results have not been made available for independent investigation, that her methods have not been scientific, and that she has often relied upon unwarranted assumptions and conclusions. Further, however complete and detailed have been her observations and investigations of individual facts and manifestations, and however large the number of individuals concerned, her study of the results obtained would not be a study of individuality. For the individuality of even the very young child is far too subtle and elusive, contains far too great a complex of social and moral, mental, æsthetic, and spiritual elements and qualities to be measurable or explicable by her crude materialistic methods and standards and tests. In fact, she has made no contribution of real value to the study of individuality. Throughout her work she confuses it with the mere superficially observable differentiæ of behaviour, attitude, predilection and choice. Her pages contain remarkably few accounts of individual children and their needs, their work, their success or failure, or of the special provision made for

them. When she does tell us of them she hastens unduly to generalise what they do and reveal and to absorb their individual contributions into the total mass of her results. Considering the claims she makes, she is far too prone to generalise about children and to act upon her general ideas of them. Her elaborate apparatus does not afford very great opportunity for the expression of individuality, for in the main it is the same for all children. Nevertheless, it is gladly acknowledged that because of the sensible arrangement of the school environment and her practical interpretation of freedom therein the child is more frequently afforded opportunities for the assertion of his individuality than is customary in the majority of kindergarten departments. Although he cannot, except within narrow limits, alter and adapt particular pieces of apparatus to suit his special requirements and ambition, yet he can find scope for self-expression in the choice of piece and of a place and a time to use it. He is not the slave of a time-table, and he may in his simple and delightful way commune and co-operate with his fellows.

In growing numbers modern educators are beginning to realise that their theory and practice must be founded upon the principle of individuality. Many able men and women are now devoting their attention to ways and means of carrying out this

principle. Materials, methods of procedure, and systems of organisation are being wisely adapted, and a sound practice is being evolved. Already there are signs that Montessorianism lags behind this movement. If the founder of the former and her followers wish to keep abreast they must seriously consider the reform of the Method in many particulars. The Dalton Laboratory Plan for the education of pupils from eight to eighteen years of age, which is broadly based upon the principles of auto-education, freedom, and individuality, is rapidly gaining in favour among teachers in many types of schools. Judged from the standpoint of these three principles its provision for the education of children from eight to eleven is of much greater value than that elaborated in *The Advanced Montessori Method* for the same ages. The latter is characterised by far too much detailed instruction, and conveys the general impression that Dr. Montessori forgets or ignores her own fundamental conceptions. There is no doubt that for the pupil of this age the Dalton Plan provides much greater opportunity for individual thought and work. Moreover, in its adoption and detailed application the individuality of teachers and parents may be freely expressed. They have not imposed on them any stereotyped and costly set of apparatus, and are not restrained in making their own arrangements by the fear of transgressing the patent law.

In our discussion of muscle and sense training in the previous chapter our remarks were on occasion critical, and no further criticism is necessary here. In regard to reading and writing it appears to many students of the Method that Dr. Montessori's insistence upon the teaching of writing first is somewhat pedantic, and that in fact she teaches them concurrently. Not for long do the little ones write without knowing what they write, and their knowing it means, of course, that they can read it. But the point is of little importance.

Teachers and parents, especially mothers, are anxious to receive from Dr. Montessori definite and reasoned pronouncements on two points which seem to them of great importance. In the first place, they wish to know her final views on the use of stories, including fairy tales, in the education of the young child. These have for ages played such a large part in the lives of children in many countries that her former opposition to their use caused a great deal of anxious questioning. It is now known that she has modified her views, and a new statement, examining the merits of different types of stories, would be of real interest and value. The treatment of this question in her lectures has hitherto been somewhat cursory and dogmatic, and has been of little help to the great majority of teachers and parents who have found it impossible to join her classes. In the second place, they desire

to know her considered views on the part to be played by religion in early education, and want direct guidance in regard to matter and method. This is a question of grave difficulty upon which her opinion has hitherto been stated with pardonable diffidence, but it is one which must be answered by a reformer who offers an all-embracing Method for the education of the young.

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